



# Knowledge Organisers

## Year 9 – Term 1

### Homework Retrieval Practice and Using your Knowledge Organiser

- Homework will be set on Microsoft Teams as an assignment.
- Homework tasks will be knowledge-based retrieval activities. They will consist of 10-20 questions which assess key knowledge that has been taught within that subject that week; e.g. When was the battle of Hastings? What is an integer? Identify the noun in this sentence.
- Feedback for these pieces of homework will then take place in lessons. The start of some of your lessons will be based on these homework tasks- so you must ensure you keep up with them all.
- You will have homework in every subject, except for PE and ASPIRE, and you will have a week to complete it. A1's will be given to everyone who completes their homework. If you don't complete it you will get a C1 and the teacher will tell you when they will be checking it again.



### Assignments

Assigned

Returned

Drafts

What is History? Quiz

Due September 7, 2022 9:00 AM

### What is History? Quiz

Due September 7, 2022 9:00 AM

#### Instructions

Complete the retrieval practice quiz.

#### Student work



What is History? Quiz (10BHi)



NAME: \_\_\_\_\_

FORM: \_\_\_\_\_



# Knowledge Organisers

## Year 9 – Term 1

- Knowledge Organisers contain the most important information you need to know for each of your subjects
- Learning these facts will help you to succeed in lessons
- If you struggle with your homework retrieval practice you can use these knowledge organisers to support you.
- You can also use these knowledge organisers as part of your revision for upcoming tests.
- You should also read your book each night
- You may be given optional homework to complete but this is not compulsory (but worth lots of achievement points!)





# Need some ideas?

## Science

Read all of the keywords, close your knowledge organiser and see how many you can remember. Check and correct	
Write definitions for producer, consumer, herbivore, carnivore, omnivore, predator, prey and top predator. Give at least one example for each for your own knowledge	
Define what the word adaptation means, think of three different plants or animals and describe how they are adapted to their environment	
List the 5 stages of natural selection and then try and use those stages to explain why giraffes have evolved to have long necks	
Draw the wave diagram from memory, include labels and definitions. Check and correct	
Explain the difference between reflection and refraction making sure you include all key words. Check and correct	
Create a spelling list for all the key words on the page. Look, cover, write, correct and repeat until you get them all right.	
Create your own drawing of the cross-section of the eye. Close your knowledge organiser, label the parts and say what each one does. Check and correct	

## Art

Write the rules for the proportion of the face	
Complete independent study task one and draw a portrait from art history	
Complete independent task two and draw a self portrait	

## History

Describe what appeasement means and the reasons for and against it. Check your knowledge organiser to see if there was any more detail you can add	
Make a glossary of all the key historical terms mentioned on the War at Home page and explain what they mean (including those in the information around the map)	
Create a mind map about the key events of the second world war without looking at your knowledge organiser. Check, correct and add detail. Keep doing this until you don't miss any off!	
Create a timeline key events of the second world war, add in facts about the key dates. Check and correct	

## Geography

Make a mind map on why people are migrating within China. Check, correct and add detail. Keep doing this until you don't miss anything off!	
Make an argument for whether China has a pollution problem.	
Cover and write out all of the key terms. Keep doing this until you have all of them written down.	
Create a clustered bar chart. What can you create one on, can you find any online?	

## Faith and Ethics

List all of the keywords to do with the Easter story without looking at your knowledge organiser. Check and correct	
List all the ways that humans are similar and different from animals	
Write the subheadings about the Hunger Games from your knowledge organiser in your book. Close your knowledge organiser and see if you can give examples from the film to prove each point	



# Need some ideas?

## Spanish

Write 4 different sentences about your taste in music in Spanish from memory, Check and correct	
Draw mind map of different types of film, write these both in Spanish and English. Check and correct	
Make flashcards for as many different adjectives as you can, keep testing yourself until you know them off by heart	
Make lists of food and drink that you like, love or dislike in Spanish, check and correct	
Write a script for a short sketch in Spanish where you order a meal from a restaurant, check and correct	
From memory write as many words as you can related to parties in English and Spanish. Check and Correct	

## Music

Draw out the 12 Bar Blues Chords in C from memory. Check and correct	
Create a table to compare Blues and Jazz. Check, correct and add detail from your knowledge organiser	
Draw out a section of the keyboard in your book. Practice playing the Blues scale in C on it	

## Drama

Make a mind map of the physical and vocal skills you can use in a performance	
From memory list the dramatic devices you can use in a scene and describe what they mean. Check and correct	
Think of a character from a film, use the keywords from the dram pages to describe how this character has been successful created.	

## DT

Draw 3 different size boxes using 2 point perspective. Describe in words how you have done it.	
From memory list the 8 healthy eating guidelines Check and correct	
Write as many keywords from the textiles pages as you can remember and, from memory, describe what they mean. Check and correct	
Make a spelling list from the keywords on the Product Design page. Look, cover, write, check and correct until you get them right.	
Write the names of the key designers mentioned on the DT pages. From memory try and list their achievements. Check and correct	

## Computing

Make flashcards of the keywords and definitions about computing. Keep testing yourself until you know them.	
Crate a spelling list from the keywords. Look, cover, write, check and correct until your know them.	
Explain in your own words what virtual reality, artificial intelligence and robotic process automation are. Check, correct and add detail.	

## PE

Draw a mind map for Tennis, Football and Athletics, add in the core skills and tactics.	
Choose one of the 4 sports, write a checklist of what you need to do to succeed.	
Name from memory as many key words from the PE page. The link each one with the sport it belongs to.	



### Plot Overview

Sephy is a Cross - a member of the ruling class. Callum is a nought - a member of the underclass who were once slaves to the Crosses. The two have been friends since early childhood. But that's as far as it can go. Until the first steps are taken towards more social equality and a limited number of noughts are allowed into Cross schools. Against a background of prejudice and distrust, intensely highlighted by violent terrorist activity by noughts, a romance builds between Sephy and Callum - a romance that is to lead both of them into terrible danger.



### The Author

Malorie Blackman Blackman was the Children's Laureate from 2013 to 2015. Blackman's motivation for writing Noughts and Crosses: 'I wanted to turn society as we know it on its head in my story, with new names for the major divisions in society. I wanted to see this new world through the eyes of the main two characters, Callum (a nought) and Sephy (a Cross). Race and racism are emotive issues that most people are loathe to discuss, but I think they should be discussed, no matter how painful.'

### Key Quotations:

- "It was because I was scared. Scared of standing out, scared of being invisible. Scared of seeming too big, scared of being too small."
- "I'd sworn on the Good Book not to lie. But the judge and the jury wouldn't understand the truth."
- "Love doesn't exist. Friendship doesn't exist—not between a nought and a Cross. There's no such thing."

### Tips for Analysing the Text

#### WHAT

- **What** is the writer trying to show us?
- **What** is the precise textual evidence to support your ideas?
- **What** is implied about a character/place/theme?



#### HOW

- **How** does evidence from the text show this?
- **How** do key words create this idea?
- **How** do the writer's methods create meaning?



#### WHY

- **Why** is the writer showing us this now?
- **Why** might the reader react in a certain way?
- **Why** is this similar or different to other moments?



### Characters:

#### The Noughts:

Callum McGregor - in love with Sephy  
Jude McGregor - Callum's brother  
Lynette McGregor - Callum's sister  
Ryan McGregor - Callum's father  
Meggie McGregor - Callum's mother

#### The Crosses:

Sephy Hadley - in love with Callum  
Kamal Hadley - Sephy's father  
Jasmine Hadley - Sephy's mother  
Minerva Hadley - Sephy's sister

### Vocabulary –

#### Analytical:

Encourages  
Rhetorical methods  
Reinforces  
Ethos, pathos, logos  
Illustrates  
Conveys  
Examines

### Vocabulary–

#### Characterisation:

Prejudice Radical  
Privileged  
Pompous  
Voiceless  
Vulnerable  
Rebellious  
Star Crossed  
Duplicity



### Other books in the 'Noughts and Crosses' series:

'Knife Edge', 'Checkmate', 'Double Cross', 'Crossfire', 'Endgame'

### ANALYTICAL VERBS TO USE

- Suggests
- Implies
- Highlights
- Portrays
- Creates
- Conveys
- Reveals
- Illustrates
- Depicts
- Reflects
- Demonstrates





# English

## Noughts and Crosses

### Unit terminology

1. Dual narrative	A story that is told from two different perspectives.
2. Contrast	A type of opposition between two ideas or objects used to highlight differences.
3. Structure	The structure of a text refers to its shape as a whole. This can mean the order of plot events.
4. Theme	The main ideas that are explored throughout a piece of literature.
5. Context	The context of a text is the place and time in which it was written, who it was written by, and where it was published. All of these affect the purpose and effect of the text.
6. Shift of focus	Changes in what the writer focuses upon as texts develop – e.g. changing from focusing on one scene to another.
7. Dystopian	An imagined society where there is great suffering and injustice.
8. First-person narrative	When the text that you are reading is told from the point of view of a character in the novel.
9. Sentence functions	Declarative – when a sentence is making a statement. Exclamative – when a sentence conveys a strong sense of emotion and alarm, or strong emphasis. Imperative – when a sentence is giving a command. Interrogative – when a sentence is asking a question.
10. Dialogue	Spoken conversation between characters in a text.

“ ”

The part that describes what a character says is the **dialogue**. This should be in **speech marks**.

The sentence ending ( ! ? ) should be before the closing speech mark:

**"Should we go now?"**

**"I'm so shocked!"**

**"I'll meet you both later."**

The part that explains *how* the character says their dialogue is called a **reporting clause**.

If the reporting clause is *before* the dialogue, then a comma goes before the opening speech mark:

**"I'll meet you later," she said.**

If the reporting clause is *after* the dialogue, then a comma is placed before the closing speech mark:

**She said, "I'll meet you later."**

If the dialogue is between 2 reporting clauses, then both rules apply:

**She said, "I'll see you later," as she slowly turned and left.**



### Writing Persuasively



**HOOK:** grab your reader's attention. Explain who you are, and why you care about this issue. **ETHOS**



**FACTS:** **LOGOS** use facts, quotes and statistics from things you have read to prove that you are right. Make a logical argument.



**ANECDOTE:** Tell a story from your life, or give a real example to explain the impact of this issue on real people.



**COUNTER-ARGUMENT:** What might people who disagree with you say, and how would you argue against them?



**EMOTIVE APPEAL:** How could you use emotive language and anger, sympathy, sadness or joy to change your reader's mind? **PATHOS**

### Key Sentence Types

#### Three Verb Sentence

The monstrous fungi believed, swelled, rose up and up, surrounding the base of every tree.

#### Not, Nor, Nor Sentence

Not a single animal, nor the rabbits I had seen on the meadow, nor the mice whispering in the grass, nor even the spiders and beetles came so deeply into the forest's reach.

#### Prepositional Push Off

Beneath the thirty or forty feet of the trees' rise, the world seemed to have come to an end.

#### Never Did Than

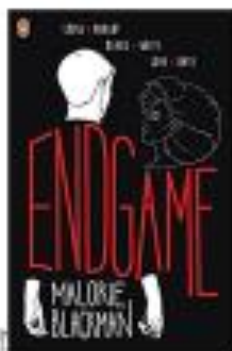
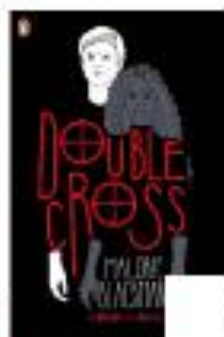
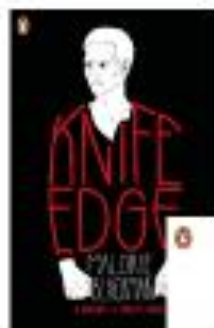
Never did a place so disturb me, than this alien, lifeless place.

#### The Writer's Aside

The familiar world – as you can imagine – was a million miles away.



Some suggestions to read and test on for AR .



These books are all in the same series as Noughts and Crosses

These books explore the themes of **Empathy**, **Prejudice** and **Discrimination** which we will also see explored in Noughts and Crosses. Please ask Mrs Roberson in the library if you would like to borrow any of these recommended reads!





# MATHS

## Comparing decimals

Ones	Tenths	hundredths
	0.1 0.1	
	0.1	

Ones	Tenths	hundredths
	0.1	0.01 0.01
	0.1	0.01

$$0.3 > 0.23$$

"There are more counters in the furthest column to the left"

0.30

0.23

Comparing the values both with the same number of decimal places is another way to compare the number of tenths and hundredths

ones	tenths	hundredths
	0.1 0.1 0.1	0.01 0.01

We say "nought point five two"  
Five tenths and two hundredths

$$\begin{aligned} &0 \text{ ones, 5 tenths and 2 hundredths} \\ &0 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.01 + 0.01 \\ &= 0 + 0.5 + 0.02 \\ &= 0.52 \end{aligned}$$

## Written methods of calculation

### Round to decimal places

2.46192

Focus on the numbers after the decimal point

"To 1dp" - to one number after the decimal

"To 2dp" - to two numbers after the decimal

2.46192 (to 1dp) - Is this closer to 2.4 or 2.5



2.4 6192 This shows the number is closer to 2.5

2.46192 (to 2dp) - Is this closer to 2.46 or 2.47



2.46 192 This shows the number is closer to 2.46

### Estimate the calculation

Round to 1 significant figure to estimate

$$4.2 + 6.7 \approx 4 + 7 \approx 11$$

This is an **overestimate** because the 6.7 was rounded up more

The equal sign changes to show it is an estimation

$$21.4 \times 3.1 \approx 20 \times 3 \approx 60$$

This is an **underestimate** because both values were rounded down

It is good to check all calculations with an estimate in all aspects of maths - it helps you identify calculation errors

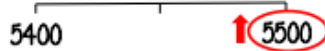
### Round to powers of 10 & 1 significant figure

number is halfway between we "round up"

5495 to the nearest 1000



5475 to the nearest 100



5475 to the nearest 10



370 to 1 significant figure is 400

37 to 1 significant figure is 40

3.7 to 1 significant figure is 4

0.37 to 1 significant figure is 0.4

0.00037 to 1 significant figure is 0.0004

Round to the first non-zero number

### Order of operations

R

**Brackets** Operations in brackets are calculated first

**Other** operations e.g. powers, roots,

**Multiplication/ Division**

They are carried out in the order from left to right in the question

**Addition/ Subtraction**

They are carried out in the order from left to right in the question





# MATHS

## Manipulation of Expressions

### Simplify Expressions

Like terms: are multiples of the same variable, such as  $3b$  and  $5b$

Simplify: add or subtract like terms

#### examples

$$\begin{aligned} \text{Simplify } 3a - 5a - a \\ = -3a \end{aligned}$$

$$\begin{aligned} \text{Simplify } -3b + 8b \\ = 5b \end{aligned}$$

$$\text{Simplify } 5y - 6 - 3y + 3$$

This expression is the sum of:  $5y + -6 + -3y + 3$

Add like terms:  $2y - 3$

this is the same as  $-3 + 2y$

### Form expressions

For unknown variables, a letter is normally used in its place

More than — **ADD**

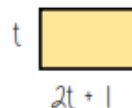
Less than/ difference — **SUBTRACT**

eg 4 more than  $t \longrightarrow t + 4$

8 less than  $k \longrightarrow k - 8$

Only similar terms can be grouped together

eg Find the perimeter of this shape  
(Perimeter = length around outside of shape)



$$t + 2t + 1 + t + 2t + 1 \longrightarrow 6t + 2$$

### Factorise linear expressions

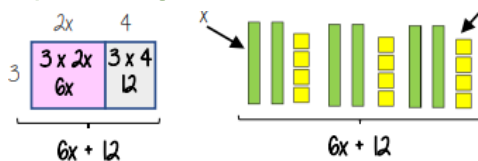
Fully factorise:  $\longrightarrow$  To fully factorise means take out the highest common factor

$$\begin{aligned} 5b - 25 \\ \text{hcf is } 5 \\ 5b - 25 = 5(b - 5) \end{aligned}$$

$$\begin{aligned} 12a + 8 \\ \text{hcf is } 4 \\ 12a + 8 = 4(3a + 2) \end{aligned}$$

$$\begin{aligned} 2n^2 + 6n \\ \text{hcf is } 2n \\ 2n^2 + 6n = 2n(n + 3) \end{aligned}$$

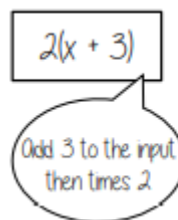
### Expand single brackets



$2x + 4$	$2x + 4$	$2x + 4$
$x \ x \ 4$	$x \ x \ 4$	$x \ x \ 4$
$6x + 12$		

Different representations of  $3(2x + 4) = 6x + 12$

### Substitution into expressions



Put the expression into a function machine

INPUT  $\longrightarrow$   $+3$   $\longrightarrow$   $\times 2$   $\longrightarrow$  OUTPUT

If  $x = 10$   
 $10 + 3 = 13 \dots 13 \times 2 = 26$

### Expand double brackets

Expand & Simplify:

$$\begin{array}{r} (x + 2)(x + 3) \\ \downarrow \\ \begin{array}{cc} \times & x & + 2 \\ x & \begin{array}{|c|c|} \hline x^2 & + 2x \\ \hline \end{array} \\ + 3 & \begin{array}{|c|c|} \hline + 3x & + 6 \\ \hline \end{array} \end{array} \end{array}$$

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



# MATHS

## Indices

### Laws of Indices

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$a^0 = 1$$

$$a^{-m} = \frac{1}{a^m}$$

### HIGHER TIER ONLY

$$a^{\frac{1}{m}} = \sqrt[m]{a}$$

$$a^{\frac{n}{m}} = (\sqrt[m]{a})^n$$

### Addition and Subtraction Laws

$$a^m \times a^n = a^{m+n}$$

Examples

$$2^2 \times 2^3 = 2 \times 2 \times 2 \times 2 \times 2 = 2^5$$

$$k^4 \times k^2 = k \times k \times k \times k \times k \times k = k^6$$

$$a^m \div a^n = a^{m-n}$$

Examples

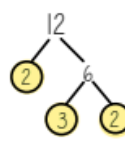
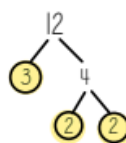
$$5^3 \div 5 = \frac{5 \times 5 \times 5}{5} = 5^2$$

$$d^5 \div d^2 = \frac{d \times d \times d \times d \times d}{d \times d} = d^3$$

### Product of Prime Factors

Example 1

Write 12 as a product of it's prime factors

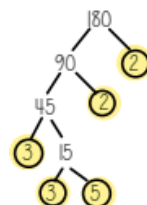


Both of these trees represent the same decomposition

$$12 = 2 \times 2 \times 3 = 2^2 \times 3$$

Example 2

Write 180 as a product of it's prime factors



$$180 = 2 \times 2 \times 5 \times 3 \times 3 = 2^2 \times 3^2 \times 5$$

Always try to write your final answer in ascending order using index notation!

Using prime factor decomposition.

If we know that 12 written as a product of it's prime factors, how does that help us to write 36 as a product of it's prime factors?

We know  $12 \times 3 = 36$  therefore we can multiply our answer by three and  $36 = 2 \times 2 \times 3 \times 3 = 2^2 \times 3^2$

What about 120?

Well 120 is  $10 \times 12$  so we can say  $120 = 2 \times 2 \times 3 \times 5 \times 2 = 2^3 \times 3 \times 5$

Remember  $10 = 2 \times 5$

### Fractional Indices

#### HIGHER TIER ONLY

$$a^{\frac{1}{m}} = \sqrt[m]{a}$$

Examples

$$25^{\frac{1}{2}} = \sqrt{25} = 5 \quad 8^{\frac{1}{3}} = \sqrt[3]{8} = 2$$

$$a^{\frac{n}{m}} = (\sqrt[m]{a})^n$$

Examples

$$25^{\frac{3}{2}} = (\sqrt{25})^3 = 5^3 = 125$$

Remember that this is the same as  $(25^{\frac{1}{2}})^3$

### Negative Fractional Indices

#### HIGHER TIER ONLY

EXAMPLE 1

$$8^{-\frac{1}{3}} = \frac{1}{8^{\frac{1}{3}}} = \frac{1}{\sqrt[3]{8}} = \frac{1}{2}$$

Remember this means the cube root of 8

EXAMPLE 2

$$25^{-\frac{3}{2}} = \frac{1}{25^{\frac{3}{2}}} = \frac{1}{(\sqrt{25})^3} = \frac{1}{5^3} = \frac{1}{125}$$

Remember this is the same as  $(25^{\frac{1}{2}})^3$

EXAMPLE 3

$$(343x^9)^{-\frac{2}{3}} \div x^3 = \frac{1}{(343x^9)^{\frac{2}{3}}} \div x^3 = \frac{1}{(7x^3)^2} \div x^3 = \frac{1}{49x^6} \times \frac{1}{x^3} = \frac{1}{49x^9}$$

Don't forget the order of operations!

Remember instead of dividing by  $x^3$  cubed, we can multiply by the reciprocal

### Key terms

- Base:** the number that gets multiplied by a power
- Power:** the number of times the number is used in a multiplication.
- Exponent:** power (see above)
- Index:** power (see above)
- Coefficient:** a number used to multiply a variable
- Variable:** a letter which represents an unknown number
- Commutative:** changing the order of the operations doesn't change the result



# MATHS

## Square and Cube Numbers

When working with indices, it is helpful to know your square and cube numbers!

### SQUARE NUMBERS

1, 4, 9, 16, 25, 36,  
49, 64, 81, 100, 121,  
144, 169, 196, 225...

### CUBE NUMBERS

1, 8, 27, 81, 125,  
216, 343, 512...

You are  
expected to  
know these!

## Simplifying Surds

Simplify  $\sqrt{24}$ .

Here we are looking for the  
largest square number which is  
also a factor of 24

Factors of 24:  
1 x 24  
2 x 12  
3 x 8  
4 x 6

$$\begin{aligned}\text{So } \sqrt{24} &= \sqrt{4 \times 6} \\ &= \sqrt{4} \times \sqrt{6} \\ &= 2\sqrt{6}\end{aligned}$$

Here we are looking for the  
largest square number which is  
also a factor of 96

Factors of 96:  
1 x 96  
2 x 48  
3 x 32  
4 x 24  
6 x 16  
8 x 12

Simplify  $\sqrt{96}$ .

$$\begin{aligned}\text{So } \sqrt{96} &= \sqrt{16 \times 6} \\ &= \sqrt{16} \times \sqrt{6} \\ &= 4\sqrt{6}\end{aligned}$$

## Adding and Subtracting Surds

$$\sqrt{5} + \sqrt{5} = 2\sqrt{5} \quad \leftarrow \text{think of this like } x + x, \text{ or 2 lots of } x$$

$$\begin{aligned}4\sqrt{3} + 7\sqrt{3} &= 11\sqrt{3} \\ 8\sqrt{2} - 5\sqrt{2} &= 3\sqrt{2}\end{aligned}$$

coefficients are dealt with just like  
they are in algebra

$$2\sqrt{3} - 7\sqrt{5} \quad \leftarrow \sqrt{3} \text{ and } \sqrt{5} \text{ are UNLIKE TERMS so this cannot be simplified any further}$$

$$4\sqrt{7} + 3\sqrt{10} - \sqrt{7} - 2\sqrt{10} = 3\sqrt{7} + \sqrt{10}$$

$$\sqrt{12} + \sqrt{27} = 2\sqrt{3} + 3\sqrt{3} = 5\sqrt{3}$$

$$\begin{aligned}\sqrt{12} &= \sqrt{4 \times 3} = 2\sqrt{3} \\ \sqrt{27} &= \sqrt{9 \times 3} = 3\sqrt{3}\end{aligned}$$

It is important to try and  
simplify your surds before  
working with them so you  
don't miss things like this!

# Roots

## Multiplying and Dividing Surds

$$\sqrt{2} \times \sqrt{5} = \sqrt{2 \times 5} = \sqrt{10}$$

$$\sqrt{a} \times \sqrt{b} = \sqrt{ab}$$

$$\sqrt{3} \times \sqrt{7} = \sqrt{3 \times 7} = \sqrt{21}$$

$$\sqrt{2} \times \sqrt{2} = \sqrt{2 \times 2} = \sqrt{4} = 2$$

$$\sqrt{a} \times \sqrt{a} = a$$

$$\sqrt{5} \times \sqrt{5} = \sqrt{5 \times 5} = \sqrt{25} = 5$$

## Dividing Surds

$$\sqrt{10} \div \sqrt{2} = \sqrt{10 \div 2} = \sqrt{5}$$

$$\sqrt{a} \div \sqrt{b} = \sqrt{\frac{a}{b}}$$

$$\sqrt{12} \div \sqrt{3} = \sqrt{12 \div 3} = \sqrt{4} = 2$$

## Key terms

- Integer:** a whole number
- Rational Number:** a number which can be expressed in the form  $\frac{a}{b}$ , where a and b are integers
- Irrational Number:** a number which cannot be expressed in the form  $\frac{a}{b}$ , where a and b are integers
- Expand:** multiply out the brackets
- Square Number:** the result of multiplying an integer by itself

## Expanding Brackets

**Example 1**  
Expand and simplify  $\sqrt{3}(2 + \sqrt{6})$

X	2	$\sqrt{6}$
$\sqrt{3}$	$2\sqrt{3}$	$\sqrt{18}$

$$\begin{aligned}&= 2\sqrt{3} + \sqrt{18} \\ &= 2\sqrt{3} + 3\sqrt{2}\end{aligned}$$

Always remember to  
check if you can  
simplify your surds

**Example 2**  
Expand and simplify  $\sqrt{3}(3\sqrt{8} - 2\sqrt{2})$

X	$3\sqrt{8}$	$-2\sqrt{2}$
$\sqrt{3}$	$3\sqrt{24}$	$-2\sqrt{6}$

$$\begin{aligned}24 &= 2 \times 2 \times 2 \times 3 \\ \text{So } \sqrt{24} &= \sqrt{2 \times 2 \times 2 \times 3} \\ &= 2 \times \sqrt{2 \times 3} \\ &= 2\sqrt{6}\end{aligned}$$

$$\begin{aligned}&= 3\sqrt{24} - 2\sqrt{6} \\ &= 6\sqrt{6} - 2\sqrt{6} \\ &= 4\sqrt{6}\end{aligned}$$

**Example 3**  
Expand and simplify  $(1 + \sqrt{3})(\sqrt{2} - 1)$

We can treat this just  
like we do double  
brackets in algebra

X	1	$\sqrt{3}$
$\sqrt{2}$	$\sqrt{2}$	$\sqrt{6}$
-1	-1	$-\sqrt{3}$

$$= \sqrt{2} - \sqrt{3} + \sqrt{6} - 1$$

None of these are 'like  
terms' so we cannot  
simplify anymore

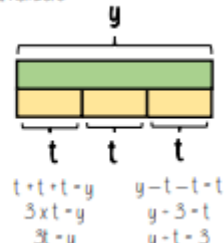
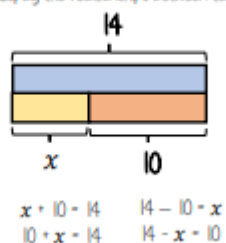
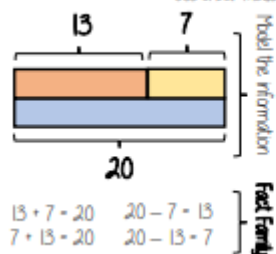


# MATHS

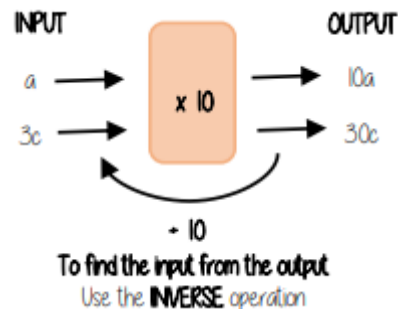
## Rearranging formulae

### Fact Families

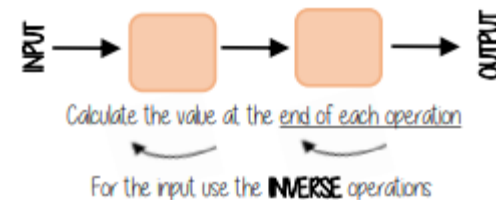
Use a bar model to display the relationships between terms and numbers



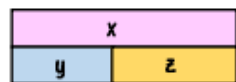
### One step function machines



### Two step function machines



### Rearranging formulae (one step)



$$x = y + z$$

Rearrange to make y the subject

$$y = x - z$$

$$y \rightarrow +z \rightarrow x$$

$$y \leftarrow -z \leftarrow x$$

Using inverse operations or fact families will guide you through rearranging formulae

Rearranging can also be checked by substitution

Language of rearranging...

Make XXX the subject

Change the subject

Rearrange

### Rearranging formulae (two step)

In an equation (find x)

$$4x - 3 = 9$$

$$+3 \quad +3$$

$$4x = 12$$

$$\div 4 \quad \div 4$$

$$x = 3$$

In a formula (make x the subject)

$$xy - s = a$$

$$+s \quad +s$$

$$xy = a + s$$

$$\div y \quad \div y$$

$$x = \frac{a + s}{y}$$

The steps are the same for solving and rearranging

Rearranging is often needed when using  $y = mx + c$

e.g Find the gradient of the line  $2y - 4x = 9$

Make y the subject first  $y = \frac{4x + 9}{2}$  Gradient =  $\frac{4}{2}$

### Key terms

#### Expression

A sentence with a minimum of two numbers and one maths operation

#### Equation

A statement that two things are equal

#### Term

A single number or variable

#### Identity

An equation where both sides have variables that cause the same answer includes  $\equiv$

#### Formula

A rule written with all mathematical symbols e.g area of a rectangle  $A = b \times h$

### Further examples

Make y the subject of:  
 $4 - 2y = 2y + 3u$

$$4 - 2y = 2y + 3u$$

$$(+2y) \quad (+2y)$$

$$4 = 4y + 3u$$

$$(-3u) \quad (-3u)$$

$$4 - 3u = 4y$$

$$(\div 4) \quad (\div 4)$$

$$y = \frac{4 - 3u}{4}$$

Make p the subject of:

$$m = (p - y)^2$$

$$(\sqrt{\quad}) \quad (\sqrt{\quad})$$

$$\pm \sqrt{m} = p - y$$

$$(+y) \quad (+y)$$

$$y \pm \sqrt{m} = p$$

$$p = y \pm \sqrt{m}$$

Make n the subject of:

$$an - 2n = b^2$$

$$(factorise)$$

$$n(a - 2) = b^2$$

$$(\div (a - 2)) \quad (\div (a - 2))$$

$$n = \frac{b^2}{a - 2}$$





# MATHS

## Ratio and Proportion

### Simplifying a Ratio

Cancel down the ratio to its lowest form

"For every 6 days of rain there are 4 days of sun"

6:4

↓ by 2

3:2

"For every 3 days of rain there are 2 days of sun" — when this happens twice the ratio becomes 6:4

Find the biggest common factor that goes into all parts of the ratio

For 6 and 4 the biggest factor (number that multiplies into them) is 2

### Direct Proportion

As one variable changes the other changes at the same rate.

This is a multiplicative change

4 cans of pop = £2.40

4 cans of pop = £2.40

12 cans of pop = £7.20

2 cans of pop = £1.20

Sometimes this is easiest if you work out how much one unit is worth first e.g. 1 can of pop = £0.60

This multiplier is the same in the same way that this would be for ratio

### Inverse Proportion

As one variable is multiplied by a scale factor the other is divided by the same scale factor

Examples of inversely proportional relationships

Time taken to fill a pool and the number of taps running

Time taken to paint a room and the number of workers

T is inversely proportional to G. When T=2 then G=20

T	1	2	8
G	40	20	5

÷ 2      × 4

× 2      ÷ 4

### Best buys

To calculate best buys you need to be able to compare the cost of one unit or units of equal amounts



Shop A

4 cans for £1.20  
↓  
£1.20 ÷ 4  
1 can is £0.30  
Or 30p

Cost per item

Shop A is the best value as it is 1p cheaper per can of pop



Shop A

4 cans for £1.20  
↓  
4 ÷ £1.20  
£1 buys 3.333 cans of pop

Cost per pound

Shop A is still shown as being the best value but pay attention to the unit you are calculating, per item or per pound

Best value is the most product for the lowest price per unit

Shop B

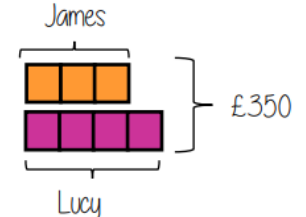
3 cans for 93p  
↓  
£0.93 ÷ 3  
1 can is £0.31  
Or 31p

### Sharing in a Ratio

James and Lucy share £350 in the ratio 3:4.  
Work out how much each person earns

Model the Question

James: Lucy  
3:4



Find the value of one part

Whole: £350  
7 parts to share between  
(3 James, 4 Lucy)

£350 ÷ 7 = £50  
□ = one part  
= £50

Put back into the question

James: Lucy  
3:4  
x 50      x 50  
£150:£200

James = 3 x £50 = £150

Lucy = 4 x £50 = £200

### Key terms

**Proportion:** a comparison between two numbers

**Ratio:** a ratio shows the relative size of two variables

**Direct proportion:** as one variable is multiplied by a scale factor the other variable is multiplied by the same scale factor.

**Inverse proportion:** as one variable is multiplied by a scale factor the other is divided by the same scale factor.



# MATHS

## Sequences

### Types of Sequences

Arithmetic sequences are one where the difference between each term is the same

1, 2, 3, 4, 5, ...    2, 5, 8, 11, ...    5, 10, 15, 20, ...

Geometric sequences are ones where each term is found by multiplying previous terms by a fixed number

2, 4, 6, 8, ...    10, 30, 90, 270, ...    -3, -6, -12, -24, ...

### The Language of Sequences

The term-to-term rule is '+2'

The second term of this sequence is 3

1, 3, 5, 7, 9, 11, ...

This is an arithmetic sequence as the difference between each term is the same

### Using the nth term

#### Example

The rule is  $4n+1$ . Find the first 3 terms

1st term:  $4(1) + 1 = 5$

2nd term:  $4(2) + 1 = 9$

3rd term:  $4(3) + 1 = 13$

Substitute the number of the term in place of 'n'

The first three terms: 5, 9, 13, ...

### Finding the nth term

#### Example

Find the nth term of the sequence

2, 5, 8, 11, 14, ...

1. Find the term-to-term rule

2, 5, 8, 11, 14, ...  
+3 +3 +3 +3

2. Write out the times table of that common difference

3, 6, 9, 12, 15, ...

3. How do we get from the times table to our sequence?

-1, -1, -1, -1, -1, ...  
2, 5, 8, 11, 14, ...

the nth term is:

$3n - 1$

### Using the term to term rule

#### Example 1

2, 5, 8, 11, 14, ...  
+3 +3 +3 +3

The term-to-term rule is '+3'

#### Example 2

2, 4, 8, 16, ...  
x2 x2 x2

The term-to-term rule is 'x2'

### Special Sequences

#### Triangular Numbers

1, 3, 6, 10, 15, ...



#### Square Numbers

1, 4, 9, 16, 25, ...



#### Fibonacci sequence

1, 1, 2, 3, 5, 8, ...

Each term is the sum of the previous two terms



### Key terms

Arithmetic: a sequence where the difference between the term is the same

Difference: the gap between two terms in a sequence

Fibonacci sequence: a sequence where the next term is found by adding the two previous terms together

Geometric: a sequence where each term is found by multiplying the previous term by a fixed number

Position: the place of a term in a sequence

Sequence: items or numbers put into a specific order

Term: a single number or variable



# Science

## Keywords

Word	Definition
Sampling	Sampling helps us to estimate numbers of organisms in an area and build up an accurate picture of that areas biodiversity.
Biodiversity	The variety of wildlife in a particular habitat
Biotic factor	Living factor that affects the abundance of organisms
Abiotic factor	Non - living factor that affects the abundance of organisms eg temperature

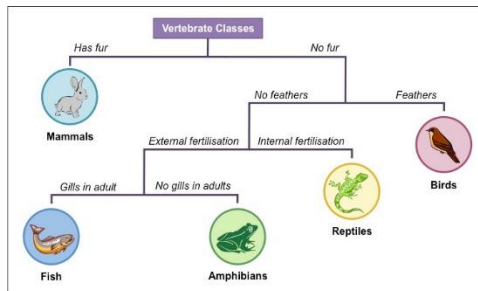
## Transect

A **transect** is a line across a **habitat** or part of a habitat. It can be as simple as a string or rope placed in a line on the ground. The number of organisms of each **species** along a transect can be observed and recorded at regular intervals

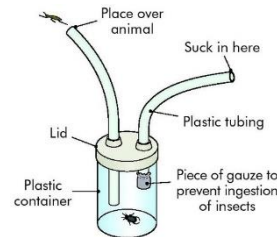


## Dichotomous keys

A series of questions to identify an unknown organism  
Starting with the 1<sup>st</sup> question, you use feature of the organism to narrow down what it could be. Sometimes the key will have statements to follow e.g. number of legs, followed by options. In the end, you should be left with just one possibility.



## Pooter

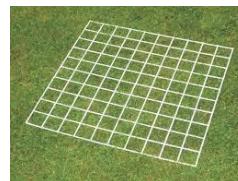


## Pitfall trap

Dig a hole in the soil using a trowel. Take a large empty yoghurt or cream carton or a disposable plastic drinking cup and place it in the hole so that its rim is level with the soil surface. Leave for several days. Insects will fall into the pitfall trap. Use a key to identify the organisms found.



## Quadrat



## Pollution indicators

The level of pollution in air or water can be indicated by the species living there. This is known as an **indicator species**.





# Science



## Keywords

Word	Definition
Hypothesis	A prediction of what will happen in an experiment
Repeatable	If the same person does an experiment using the same method and equipment, they will get the same results
Reproducible	If someone else does the experiment, or a different method or piece of equipment, the results will be similar
Valid	If an experiment is both repeatable and reproducible


## PS1 practical skills

### Variables

#### INDEPENDENT VARIABLE

 What I **CHANGE** 

#### DEPENDENT VARIABLE

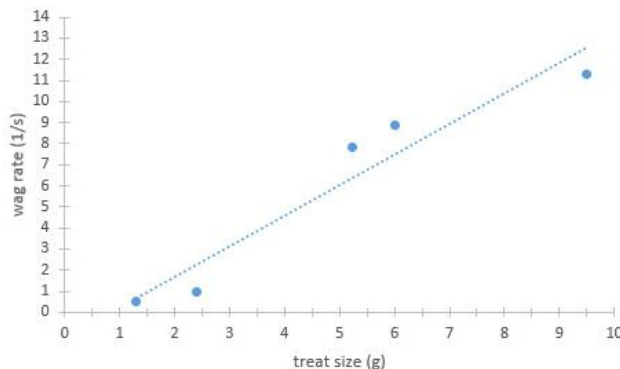
What I **OBSERVE** 

#### CONTROLLED VARIABLE

What I **KEEP THE SAME**

### Drawing graphs

- Must be at least half of the page
- Axis must be labelled, including units (in brackets)
- Accurate plotting
- Line of best fit
- Independent variable always goes on the x axis and the dependent variable goes on the y axis
- Always use a pencil and ruler



$$\text{Mean} = \frac{\text{Sum of values}}{\text{Number of values}}$$

For example, the mean of 3, 6, 7, 9 and 9 is

$$\frac{3 + 6 + 7 + 9 + 9}{5} = \frac{34}{5} = 6.8$$

**Analysis** = state the trend shown in your results. Quote data. Identify any anomalous results

**Evaluation** = what went wrong in your experiment?

How can it be improved?

Study Time vs. Grades

Student	Study Time (hours)	Grade
Bob	2	84
Carlos	4	91
Cindy	5	92
Florence	3	89
Kim	4	88
Lori	4	93
Marisa	1	78
Pat	2	89
Thomas	5	94
Wendy	2.5	87

### Drawing tables

- Use a ruler and pencil
- Units should only be in column headings (not in columns)
- Independent variable always goes in the right hand column

### Example risk assessment

Hazard – an item that can cause harm	Risk – how it causes harm	Precaution – how to prevent harm
Eg Hydrochloric acid	Corrosive	Wear goggles, rinse off skin if there is contact

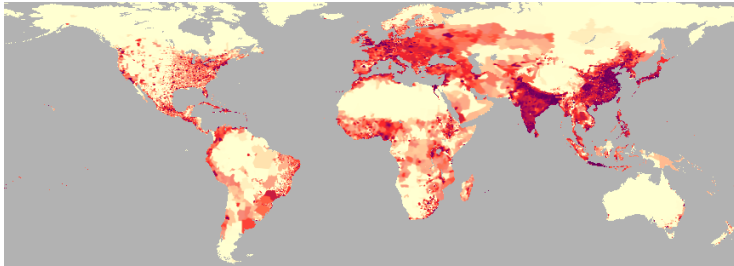




# Geography

## Autumn 1: World population

### World population distribution



- The DENSEST populations are found in South East Asia- Particularly India, China, Japan and Bangladesh.
- Europe has a high population density.
  - Australia and the Americas has relatively SPARSE population density
- Africa's population density is increasing

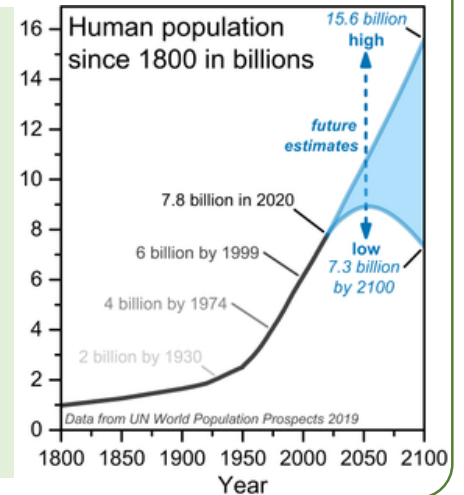
### World population growth

World population has increased rapidly since 1960.

In HIC's the growth is steady

In NEE's the growth is rapid

In LIC's the growth is increasing rapidly



#### DECREASE

Education on family planning and access to contraception from the 1960's onwards has resulted in a decline in births in HIC's

#### INCREASE

In Low and middle income countries, better farming methods results in healthier diets and less malnutrition.

#### INCREASE

Historically after world wars men would return home and start families resulting in a baby boom.

#### DECREASE

As women choose to pursue careers, they start families later in life so have less children.

**BUT.....**  
Overall,  
population is  
increasing!!!

Why has world population changed?

#### INCREASE/DECREASE

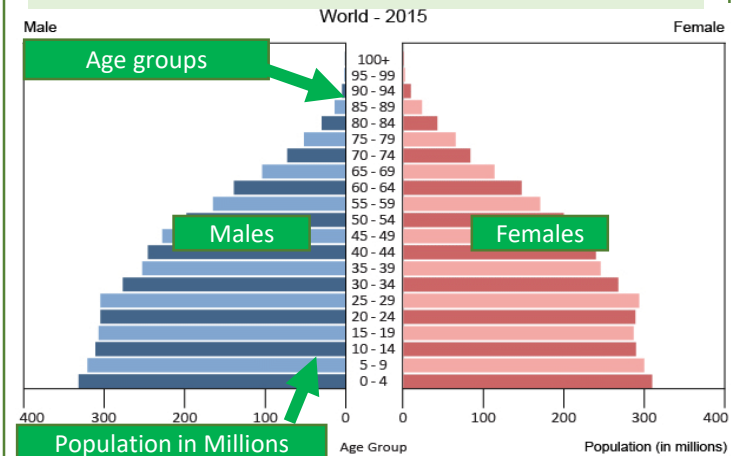
Some governments like India provide incentives to have LESS children whilst those like Russia provide incentives for families to have more.

#### INCREASE

Access to clean water and medicine means there is less chance of life ending diseases in middle income countries so people live longer.

### Population Pyramids

LIC's have wide bases (many children) HIC's have wide tops (ageing population)



These are important because they show us how many males and females there are per age group. It's a way we can monitor how future population within a country might change



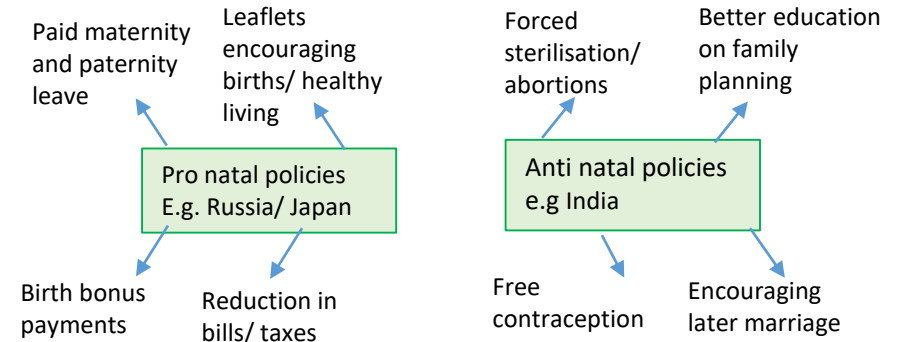
# Geography

## Key terms

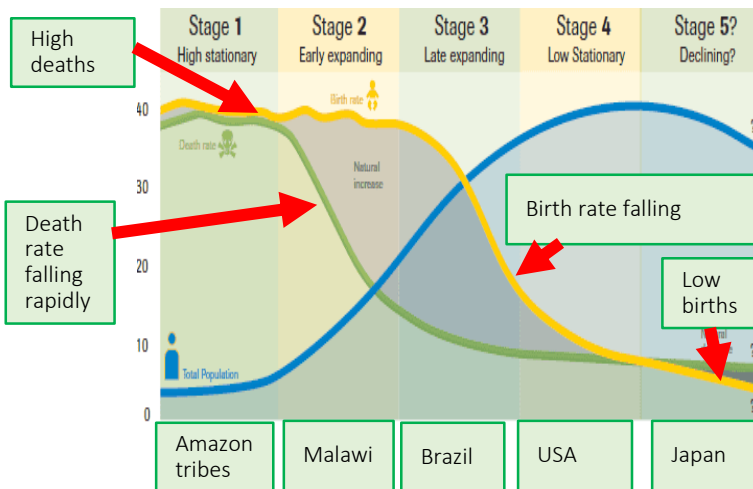
<b>Population distribution</b>	How spread out a population is in terms of density and sparsity
<b>Population density</b>	The number of people that live in a square kilometer
<b>Refugee</b>	A person who wants to live permanently in a country that is safer than their own.
<b>Asylum seeker</b>	A person who leaves their country because they feel unsafe.
<b>Pension</b>	A regular payment made by the government to people over a certain age- This right is earned through paying tax over time.
<b>Diaspora</b>	When people of an ethnic population are spread far from their origin
<b>Ethnicity</b>	A persons language, culture, religion or tradition
<b>Ageing population</b>	The growth of proportion of elderly people (usually over 65)

## Autumn 1: World population

### Population policies



### The Demographic Transition model



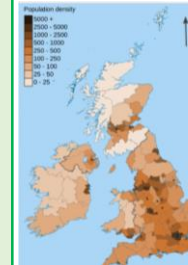
As a country develops it's population changes.

- In stage 2- deaths begin to decline
- In stage 3- Births also begin to decline.
- By stage 4 births and deaths are low.
- By stage 5 births drop below deaths resulting in population decrease!

Example countries are shown below the DTM.

### Population in the UK

The **densest** populations are in **The South East, Midlands and North West**. The **sparsest** is in the **West** including **Wales** and the **North**, particularly **North Scotland**.



Most ethnic minorities live in large urban areas in the UK. There is higher diversity here due to safety and cultural ties.

Despite UK population increasing by 4 million in ten years, some villages far from cities are experiencing population decline, with many services closing and house prices falling.

### The UK's ageing population

<b>Opportunities</b>		<b>Challenges</b>
Retired people can often afford to spend money on tourism.		Higher taxes for pensions.
Elderly people often use spare time to volunteer.		The NHS is struggling to cope
Older relatives often look after children.		Often, elderly people can suffer with loneliness.
Older people can give younger people good advice.		The government may have to raise the retirement age.
<b>SOCIAL</b>	<b>ECONOMIC</b>	Difficult to look after elderly.

18% of UK residents are over 65!

This is due to increase to over 34% by 2046

An ageing population will create opportunities and challenges



# Geography

## Autumn 2- Global Issues- Climate change

### Global Issue

A Global issue is something which affects people all over the world

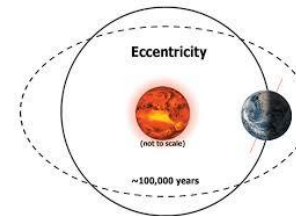
- It can be over a period of months, years or decades
- It can only be solved by people and countries from all over the world working together.



### Natural causes of global warming

#### Volcanic eruptions

Release ash and gas which reflects sunlight back into space making it COLDER



#### Earth Orbit

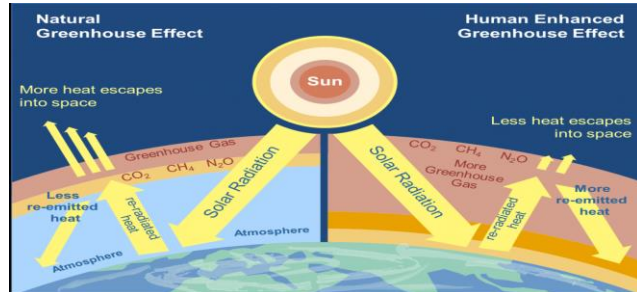
This changes every 100,000 years meaning sometimes we are closer to the sun making us WARMER

#### Sun spots

The sun experiences solar flares and sunspots every 11 years making the planet WARMER



### Human causes of global warming



Deforestation (chopping down forests) means less CO<sub>2</sub> is recycled by nature

Farming, in particular cattle and rice, produce a lot of methane

Vehicles produce around 20% of global CO<sub>2</sub> emissions

Power generation using fossil fuels creates about 30% of global CO<sub>2</sub> emissions

Industry uses a lot of fossil fuels in manufacturing

Animals and humans all breathe out CO<sub>2</sub>

Humans release greenhouse gases such as methane (through rice farming and cattle production). Carbon dioxide through burning of fossil fuels and vehicles.

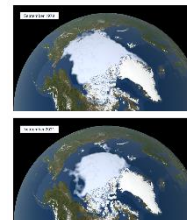
The atmosphere becomes thicker with gases, which means less of the heat can escape back into space

The increased trapped heat melts ice caps leading to sea level rise

### Evidence of global warming

#### Ice cores

Measure the past CO<sub>2</sub> levels. Plant pollen trapped in ice can tell us the plant types over time.



#### Dwindling sea ice

Satellites show Arctic ocean sea ice has reduced by 65% since 1975 clearly showing recent warming.

#### Rising sea levels

Pacific islands are at risk of disappearing due to global sea level rise between 3 and 4 cm every 10 years.







# Geography

## Autumn 2- Global Issues- Climate change

### Global impacts of climate change

**Hurricane strength**- The rise in sea temperatures may lead to more frequent and more powerful hurricanes in the USA

**Extinct species**- The rapid change in temperature means that rare plants in the Amazon may become extinct

**Glacier melting**- The glaciers in Peru are melting and this is causing issues such as flooding. People rely on the glaciers melting for their water supply

**Forced migration**- People in low lying countries such as Bangladesh may be forced to migrate to other countries

**Drought and famine**- Some areas such as Somalia experience less rainfall and more evaporation. Crops may fail which can lead to malnutrition

### Sinking islands case study

#### Causes

**Melting Ice**- Melting of land ice causes amount of water in the oceans to increase (this causes the oceans to rise)

#### Social impacts

Homelessness  
Sea water contaminating freshwater

#### Economic impacts

Loss of tourism and jobs  
Loss of airport  
Costly coastal defences

#### Environmental impacts

Loss of beaches  
Soil washed away  
Animal habitats lost

#### Solutions (Adaptions)

*They have tried to adapt*  
Create new land by adding dumping rock into the sea  
Getting a Dutch company to create floating homes  
Building a large sea wall around the capital but.....  
Many locals are afraid that one day they may have to move.



#### Factfile

**Location**- Indian ocean

**Population**- 520,000

**Capital**- Male (142,000)

**GDP per capita** \$10400

**Main industry**- Tourism

### Local impacts of climate change

Risk of flooding affects businesses and infrastructure

Risk of health from extreme summer temperatures

Risk to wildlife, plant ecosystems and soil

Risk to UK food production due to more insect pests



High

Low

### Managing climate change

International agreements such as the COP 26 and Paris climate agreement can get countries to set green targets

Encourage businesses and individuals to recycle, use less energy and vehicles reduce CO2 emissions (Sustainability)



Capture CO2 before it enters the atmosphere and store it underground.

Replace oil, gas and coal non renewables with wind, solar and hydro electric power

Plant more trees because they absorb CO2 and release oxygen.



# History

## Keywords and Phrases:

**Buffalo Dance** - Spiritual dance to attract buffalo to the tribe and to give thanks for the life of the buffalo

**Culture** - a way of living shared by a group of people

**Ghost Dancers** - Native dance to call upon the dead to rise up and fight the White American army

**Great Spirit** - the Sioux tribe God

**Homestead Act** - A law which allowed White farmers to take over lands where Natives lived

**Indigenous** - someone who originates from a certain place

**Manifest destiny** - the belief that White Americans should spread Christianity across America, including converting Natives

**Nomadic** - a traveller's way of life. No fixed address.

**Plains** - large area in the middle of America - where many tribes lived

**Reservation** - a place where Natives were forced to live

**Tipi (Teepee)** - a cone shaped tent which many tribes lived in

# Native Americans

## Important Dates:

**Late 1400s/Early 1500s** - first contact with Europeans

**Late 1500s/Early 1600s** - first contact with White English explorers and settlers

**Mid 1700s** - Natives involved in a series of wars between Britain and France fighting over control of America

**Late 1700s/Early 1800s** - White Americans start to expand across America from East to West. Killing Natives and destroying their culture.

**Late 1800s** - final defeat for the Native tribes against the White American army. The remaining Natives are forced to live on 'reservations'.

## Key people to research:

General Custer



Sitting Bull



Sacagawea





# Art

## Independent Study Tasks

## IDENTITY

### Independent Study Task One:

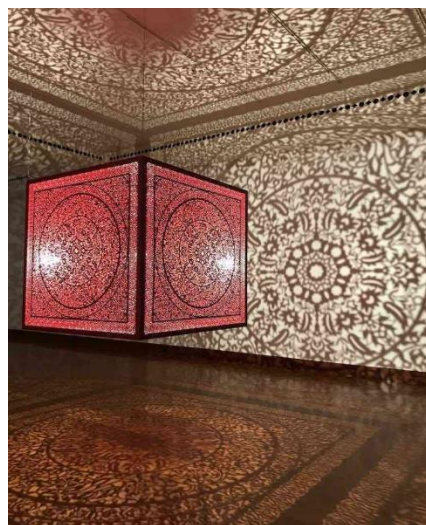
**Analysis Questions:** On the PPT template provided on your Teams page, answer the questions for EACH of the art works shown

- What's going on in this picture?
- How does this make you feel?
- How does the artist's choices in media and style impact the overall feeling of this work?
- Why do you think the artist chose to depict themselves in this way?
- What does this artwork remind you of?
- How does this artwork relate to contemporary culture?  
(ideas, customs, and social behaviour of a particular people or society)



**Molly Crabapple**, "Portraits of myself and Lola Montes with things said about us by our contemporaries", 2014

**More artist info on Teams**



**Anila Quayyum Agha**,  
"All the Flowers Are for Me"  
**More artist info on Teams**



**David Hockney**

'Joiners'

**Photomontage**

**More artist info on Teams**



### **Identity Art:**

Identity Art is a term used to describe artistic practices that prioritize questions of artists' identities and the art world's reception of their works. There is no one type or style of Identity Art. Many artists use their work to express, explore, and question ideas about identity. Factors and conditions that an individual is born with—such as ethnic heritage, sex, or one's body—often play a role in defining one's identity.

### **Independent Study Tasks 2-4**

Task 2	Working in the style of Molly Crabapple create a self portrait that focuses on boosting self-esteem which combines images, positive social media commentary and friends comments – see Teams for more info
Task 3	Working in the style of Anila Quayyum Agha, create a light projection using a 'cutwork' pattern based on your passions and hobbies- see Teams for more info
Task 4	Working in the style of David Hockney, create 3 photo 'joiners' of objects, locations or people that are important to you – see Teams for more info



# Music

Tempo  
Marking

Chord symbol

Tie

Rest

Riff

Spotify/YouTube Playlist – Listen to these EDM songs to expand your listening!



Song name	Artist	Year
Dr Who Theme	Delia Derbyshire	1963
Chase	Giorgio Moroder	1978
Sweet Dreams	Eurythmics	1983
Take On Me	A-Ha	1984
Strings of Life	Derrick May	1987
No Good (start the Dance)	The Prodigy	1994
Ray of Light	Madonna	1998

## Electronic Dance Music (EDM)

### Notes of the Treble & Bass Clefs

### Key Terms

**Synthesizer:** An electronic instrument that generates audio signals.

**MIDI:** Musical Instrument Digital Interface - allows electronic instruments to communicate with each other.

**Drum Machine:** an electronic musical instrument invented in the 1970's that can imitate drum kits and percussion instruments.

**Avant-Garde:** originally a French term, meaning in English vanguard or advance guard (the part of an army that goes forward ahead of the rest). It is used in music to mean 'ahead of its time'.

**Rave:** Commercially organised underground parties that started when clubbing became popularized in the UK.

**Riff:** A catchy melody in Dance music that is repeated throughout the song.

**Sample:** A pre-recorded piece of music or sound from another artist that you use in your own song

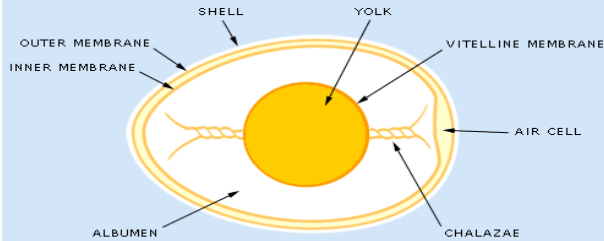




# Food & Nutrition

## Chicken egg structure

### Anatomy of an Egg



## Context

Many chemical and physical changes occur during the preparation and cooking of food.

You are unknowingly conducting basic science experiments everyday in your our laboratory The Kitchen !!

When things go wrong with cooking, you need to know why. With knowledge of the underlying science that goes on within recipes then you can prevent errors from happening.

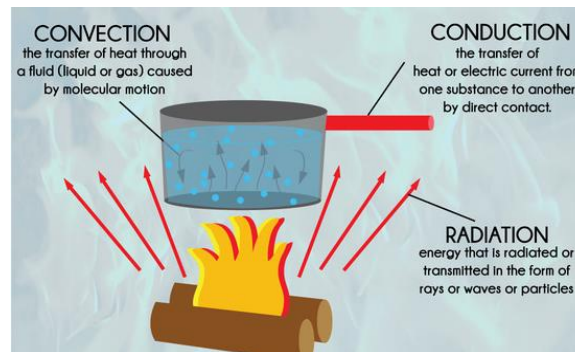


# The Science of cooking

## Key Words

<b>Coagulation</b>	An irreversible change to proteins from a liquid or semi-liquid state to a solid state.
<b>Denature</b>	The process of altering a protein's molecular characteristics or properties by heat, enzyme action or chemicals.
<b>Free Range</b>	denotes a method of farming husbandry where the animals, for at least part of the day, can roam freely outdoors, rather than being confined in an enclosure for 24 hours each day.
<b>Organic</b>	A technique, which involves the cultivation of plants and rearing of animals in natural ways
<b>Conduction</b>	The transfer of heat or electric current from one substance to another by direct contact.
<b>Convection</b>	The transfer of heat through a fluid (liquid or gas) caused by molecular motion.
<b>Radiation</b>	Energy that is radiated or transmitted in the form of rays or waves or particles.

## Methods of Heat Transfer



## Egg printing explained

### Farming Method

0 = Organic  
1 = Free Range  
2 = Barn  
3 = Cage

### Country of Origin

e.g. UK

### Additional standards for Lion Quality eggs

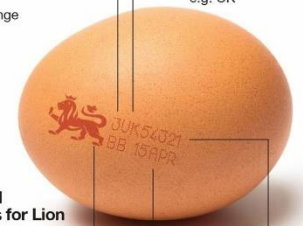
#### Lion Mark

British eggs from hens vaccinated against Salmonella and produced to a strict Code of Practice

### Best Before Date

#### Farm ID

A specific code denoting the actual farm where the eggs were produced

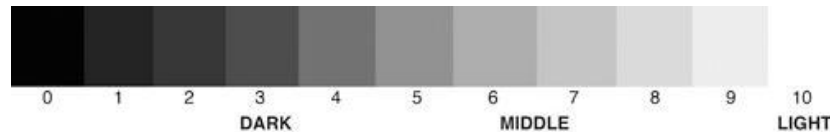






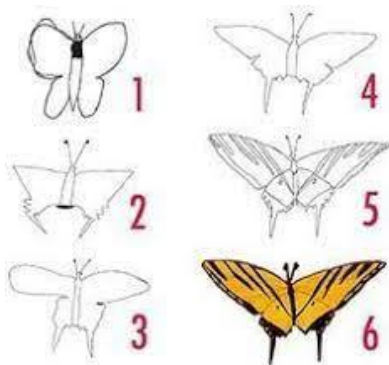
# Graphics

Year 9



## Idea Refinement

Idea refinement is the process of starting with an initial drawing or design concept. That concept is then critically analyzed and refined until you end on a finished outcome. Throughout the Graphics GCSE you get higher marks for showing your development/refinement journey. It is important to annotate your ideas to explain which areas you need to improve and what your design thinking is.



Check out 'Austin's Butterfly' on YouTube

### Bedroom Lamp project



Exploring a Context – To start a Graphics project you must explore the 'theme' or 'context'. To do this we often start with mindmaps.

**Overview**  
**More Complex Switches and Circuits**

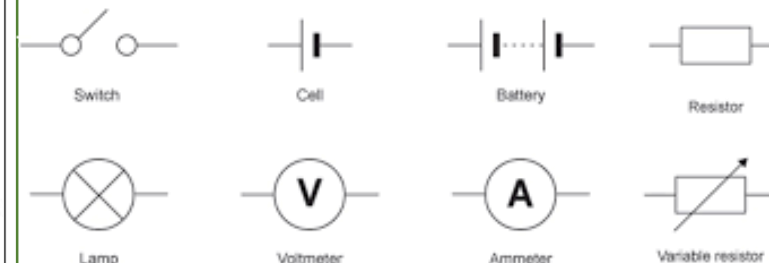
Electricity is a type of energy. It is used to power lots of things

- Electricity can flow through circuits. A circuit is the path the electric current follows. It must have no breaks in it (a closed circuit) for electricity to flow. The symbols for different objects in electrical circuits are shown on the right.
- The electricity flowing through a circuit is known as the current. It can be used to power an output device.
- Switches can be positioned so that electrical currents can flow through them (closed switch) or cannot flow through them (open switch). This alters the way that output devices function.
- In a series circuit, two output devices are controlled by one switch. In a parallel circuit, two output devices can be controlled separately by switches.
- Switches can be used alongside control boxes, to set up timed systems (e.g. traffic lights) and monitoring systems (e.g. alarms).

## Keywords

<b>Circuits</b>	An electrical circuit is a <b>complete route that an electric current can flow around</b>
<b>Refinement</b>	To refine an idea is to make small changes that improve the design. It is important to be self-critical of your designs so that you can spot opportunities for improvement.
<b>Tone</b>	This is the amount of dark or light you use when shading.
<b>Construction Lines</b>	These are lines that will help you to create an accurate drawing.
<b>Typography</b>	This is the use of font that you choose to use.

## Circuit Diagrams



### Evaluating your Designs

Even small **developments** should be evaluated.

Developments could include:

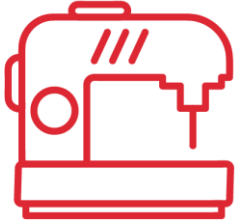
- Shape
- Colour
- Texture
- Layers
- Imagery
- Fonts
- Size
- Line

Annotation





# Textiles



## Context

Textile arts are arts and crafts that use plant, animal, or synthetic fibres to construct practical or decorative objects. Textiles have been a fundamental part of human life since the beginning of civilization.

## Examples of Cultures



## Research Focus; Culture



What is Culture?

'the ideas, customs, traditions and social behaviour of a particular people or society'

## Research Page

A Research page must include the following:  
Images  
Facts  
Sketches  
Presented creatively



## Textiles Techniques

### Applique



Applique is ornamental needlework in which pieces or patches of fabric in different shapes and patterns are sewn or stuck onto a larger piece to form a picture or pattern.

### Velcro



A fastener for clothes or other items, consisting of two strips of thin plastic sheet, one covered with tiny loops and the other with tiny flexible hooks, which adhere when pressed together and can be separated when pulled apart.

### Button



A small disc sewn on to a garment, either to fasten it by being pushed through a slit made for the purpose or for decoration.

## Key Words

### Fabrics

Fabrics are made by either weaving, knitting or bonding fibres together. These fibres could be made out of natural or synthetic fibres.

### Fibres

Fibres are hair like structures that are either natural (made from plant or animal sources) or synthetic (made from chemicals).  
Examples of natural fibres are Wool, Cotton and Silk  
Examples of synthetic fibres are Polyester, Nylon and Rayon

### Fastening

A device that closes or secures something.  
Examples of fasteners are:  
Zip  
Velcro  
Press stud  
Button  
Toggle

### Lining

An additional layer of different material attached to the inside of a garment or curtain to make it warmer or hang better.

### Pocket

A small bag sewn into or on clothing or fabric item so as to form part of it, used for carrying small articles.



# Spanish

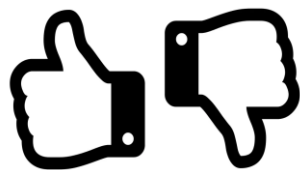


## Unit 1: This is Us



¿Qué cosas te gustan? (What things do you like?)

Question phrase		
¿Qué cosas te gustan? (What things do you like?)		
¿Qué cosas te encantan? (What things do you love?)		
¿Qué cosas te molan? (What things do you love?)		
¿Qué cosas te flipan? (What things do you love?)		
¿Qué cosas te chiflan? (What things do you love?)		
Opinion phrase	Noun	Reason
Me gusta (I like)	el baile (dance)	porque (because)
Me encanta (I love)	el cine (cinema)	me interesa (it interests me)
Me chifla (I love)	el deporte (sport)	me fascina (it fascinates me)
Me mola (I love)	el dibujo (art)	me hace sonreír (it makes me smile)
Me flipa (I love)	el teatro (the theatre)	me aburre (it bores me)
No me gusta (I dislike)	el racismo (racism)	me pone triste (it makes me sad)
No me gusta nada (I really don't like)	la moda (fashion)	me da rabia (it makes me angry)
Odio/Detesto (I hate)	la naturaleza (nature)	
	la pesca (fishing)	
	la violencia (violence)	
Me gustan (I like)	los cómics (comics)	me interesan (they interest me)
Me encantan (I love)	los insectos (insects)	me fascinan (they fascinate me)
Me chiflan (I love)	los lunes (Mondays)	me hacen sonreír (they make me smile)
Me molan (I love)	las artes marciales (martial arts)	me aburren (they bore me)
Me flipan (I love)	las injusticias (injustice)	me ponen triste (they make me sad)
No me gustan (I dislike)	las tareas domésticas (chores)	me dan rabia (they make me angry)
No me gustan nada (I really don't like)	los animales (animals)	
Odio/Detesto (I hate)		



Person	Opinion	Noun
A mi madre (my mum)	le gusta (likes)	el baile (dance)
A mi padre (my dad)	le encanta (loves)	el cine (cinema)
A mi hermano/a (my brother/sister)	le chifla (loves)	el deporte (sport)
A mi mejor amigo/a (my best friend)	le mola (loves)	el dibujo (art)
	le flipa (loves)	el teatro (the theatre)
	no le gusta (dislikes)	el racismo (racism)
	no le gusta nada (really doesn't like)	la moda (fashion)
		la naturaleza (nature)
		la pesca (fishing)
		la violencia (violence)
Mi madre (my mum)	odia (hates)	
	detesta (hates)	
	le gustan (likes)	los animales (animals)
	le encantan (loves)	los cómics (comics)
	le chiflan (loves)	los insectos (insects)
	le molan (loves)	los lunes (Mondays)
	le flipan (loves)	las artes marciales (martial arts)
	no le gustan (loves)	las injusticias (injustice)
	no le gusta nada (loves)	las tareas domésticas (chores)
Mi madre (my mum)	odia (hates)	
	detesta (hates)	



# Unit 1: This is Us



**¿Cómo organizas tu semana?** (How do you organise your week?)

Expression of frequency	Activity (present tense)
A veces (sometimes)	bailo Zumba (I dance Zumba)
Dos veces a la semana (twice a week)	cocino para mi familia (I cook for my family)
Muy a menudo (very often)	escribo canciones (I write songs)
Casi todos los días (almost every day)	juego en mi consola (I play on my games console)
Después del insti (after school)	leo revistas (I read magazines)
Los fines de semana (at weekends)	leo libros (I read books)
Los lunes (on Mondays)	monto en bici (I ride my bike)
Todo el tiempo (all the time)	navego por internet (I surf the internet)
Siempre (always)	preparo la cena (I prepare dinner)
	saco fotos (I take photos)
	toco el teclado (I play the keyboard)
	veo un partido de fútbol (I watch a football game)
	hago judo (I do judo)
	hago natación (I do swimming)
	voy de pesca (I go fishing)
	voy al parque (I go to the park)
	voy al polideportivo (I go to the sports centre)

The present tense is formed by removing the infinitive ending (ar/er/ir), and replacing it with the following:

	AR	ER	IR
Yo (I)	_o	_o	_o
Tú (you singular)	_as	_es	_es
Él/ella (he/she)	_a	_e	_e
Nosotros (we)	_amos	_emos	_imos
Vosotros (you plural)	_áis	_éis	_ís
Ellos/ellas (they)	_an	_en	_en

E.g. hablar = to speak

hablar → habl → 1. sorak







# Spanish



## Unit 1: This is Us



¿Vas a venir al cine? (Are you going to come to the cinema?)

Future tense	Type of film
Voy a ver (I'm going to see)	una película de acción (an action film)
Vas a ver (You s. are going to see)	una película de animación (an animated film)
Va a ver (He/she is going to see)	una película de aventuras (an adventure film)
Vamos a ver (we are going to see)	una película de ciencia ficción (a sci-fi film)
Vais a ver (You pl. are going to see)	una película de fantasía (a fantasy film)
Van a ver (they are going to see)	una película de superhéroes (a superhero film)
	una película de terror (a horror film)

Question
¿Vas a venir? (Are you going to come?)
¿Vamos a ver...? (Shall we see...)

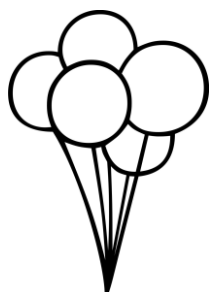
Reaction
Claro que sí (Of course)
De acuerdo (All right)
(No) voy a ir (I'm (not) going to go)
No, gracias (No, thanks)
¿Estás loco/a? (Are you crazy?)
¡Ni en sueños! (Not a chance!)
¡Qué rollo! (How boring!)

Opinion	Type of film
Me gustan (I like)	las películas de acción (action films)
Me encantan (I love)	las películas de animación (animated films)
Me chiflan (I love)	las películas de aventuras (adventure films)
Me flipan (I love)	las películas de ciencia ficción (sci-fi films)
Me molan (I love)	las películas de fantasía (fantasy films)
Mi película favorita es... (My favourite film is...)	las películas de superhéroes (superhero films)
	las películas de terror (horror films)



¿Cómo fue tu cumpleaños? (How was your birthday?)

Past tense activity	What it was like
Celebré mi cumpleaños con mi familia (I celebrated my birthday with my family)	Fue guay (it was cool)
Celebré mi cumpleaños con mis amigos (I celebrated my birthday with my friends)	Fue alucinante (it was amazing)
Fui al parque de atracciones (I went to the theme park)	Fue increíble (it was incredible)
Fui a un parque acuático (I went to a water park)	Fue flipante (it was awesome)
Fui a mi restaurante favorito (I went to my favourite restaurant)	
Invité a mis amigos a pasar la noche en mi casa (I invited my friends to sleep over at my house)	¡Lo pasé bomba! (I had a blast!)
Bebí refrescos (I drank fizzy drinks)	¡Lo pasé fenomenal! (I had an amazing time!)
Bebí batidos de fresa (I drank strawberry milkshakes)	
Comí tarta de cumpleaños (I ate birthday cake)	¡Me encantó! (I loved it!)
Recibí muchos regalos (I received lots of presents)	



The past tense is formed by removing the infinitive ending {ar/er/ir}, and replacing it with the following:

	AR	ER	IR
Yo (I)	_é	_í	_í
Tú (you singular)	_aste	_iste	_iste
Él/ella (he/she)	_o	_ió	_ió
Nosotros (we)	_amos	_imos	_imos
Vosotros (you plural)	_asteis	_isteis	_isteis
Ellos/ellas (they)	_aron	_ieron	_ieron

Ir - to go (irregular verb)
Fui (I went)
Fuiste (you (s) went)
Fue (he/she went)
Fuimos (we went)
Fuisteis (you (pl) went)
Fueron (they went)



# Spanish



¿En qué trabajas? (What's your job?)

Jobs	Responsibilities
Soy (I am)	Tengo que... (I have to...)
camarero/a (a waiter)	ayudar a los clientes (help the customers)
cocinero/a (a cook)	cortar el pelo a los clientes (cut the customer's hair)
dependiente/a (a shop assistant)	contestar al teléfono (answer the phone)
jardinero/a (a gardener)	hablar por teléfono (speak on the phone)
limpiador(a) (a cleaner)	hacer manicuras (do manicures)
peluquero/a (a hairdresser)	limpiar habitaciones (clean rooms)
repcionista (a receptionist)	preparar comida (prepare food)
	servir en el restaurante (serve in the restaurant)
	vender productos en la tienda (sell products in the shop)

¿Qué tipo de persona eres? (What type of person are you?)

In my opinion	Intensifier	Adjective
En mi opinión, soy... (In my opinion, I am...)	muy (very)	ambicioso/a (ambitious)
Creo/pienso que soy... (I believe/think I am)	bastante (quite)	organizado/a (organised)
	un poco (a bit)	serio/a (serious)
		práctico/a (practical)
		hablador(a) (talkative)
		trabajador(a) (hard-working)
		independiente (independent)
		inteligente (intelligent)
		paciente (patient)
		responsable (responsible)
		sociable (sociable)



## Unit 2: The World of Work

¿Te gusta tu trabajo? (Do you like your job?)

Opinion	My job	Because ...	Adjective
Me gusta (I like)	mi trabajo (my job)	porque (because)	es creativo (it is creative)
Me gusta mucho (I really like)		ya que (since)	es fácil (it is easy)
Me encanta (I love)		dado que (given that)	es duro (it is hard)
No me gusta (I don't like)			es estimulante (it is stimulating)
No me gusta nada (I don't like at all)			es interesante (it is interesting)
Odio (I hate)			es estresante (it is stressful)
			es monótono (it is monotonous)
			es repetitivo (it is repetitive)
			Other reason
			mi jefe/a es severo/a (my boss is strict)
			mi jefe/a (no) es muy educado/a (my boss is (not) very polite)
			los clientes (no) son simpáticos (the customers are (not) nice)
			los clientes son exigentes/maleducados (the customers are demanding/rude)
			los clientes son horribles (the customers are awful)
			mis compañeros son simpáticos (my colleagues are nice)

¿En qué te gustaría trabajar? (What job would you like to do?)

I would like to...	I want to be...	Job
Me gustaría... (I would like...)	Por eso me gustaría ser... (Therefore I would like to be...)	abogado/a (a lawyer)
No me gustaría (nada)... (I wouldn't like (at all)...)...	Quiero ser... (I want to be)	enfermero/a (a nurse)
		mecánico/a (a mechanic)
		veterinario/a (a vet)
		diseñador(a) (a designer)
		profesor(a) (a teacher)
		cantante (a singer)
		periodista (a journalist)
		policia (a police officer)
		taxista (a taxi driver)





# Spanish



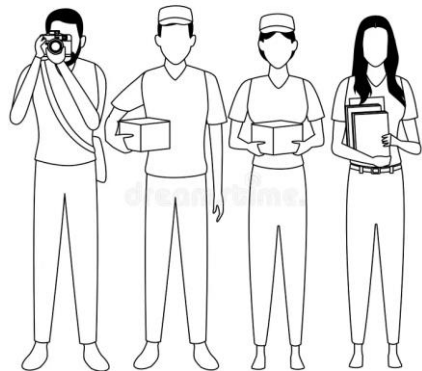
## Unit 2: The World of Work

¿Qué tal ayer en el trabajo? (How did you get on at work yesterday?)

Time markers/sequencers	Activities	Sequencers
<b>Ayer</b> (yesterday)	<b>bebí una botella de cola</b> (I drank a bottle of cola)	<b>luego</b> (then)
<b>Por la mañana</b> (in the morning)	<b>comí una hamburguesa</b> (I ate a hamburger)	<b>más tarde</b> (later)
<b>Por la tarde</b> (in the afternoon)	<b>dormí un poco</b> (I slept for a bit)	<b>finalmente</b> (finally)
<b>A la hora de comer</b> (at lunchtime)	<b>escuché música</b> (I listened to music)	
<b>Primero</b> (first)	<b>escribí SMS a mis amigos</b> (I wrote text messages to my friends)	
	<b>hablé por Skype</b> (I talked on Skype)	
	<b>jugué a un videojuego</b> (I played a video game)	
	<b>llegué tarde al trabajo</b> (I arrived late for work)	
	<b>perdí mi trabajo</b> (I lost my job)	
	<b>trabajé mucho</b> (I worked a lot)	
	<b>navegué por Internet</b> (I surfed the Internet)	

¿Cómo es un día típico? (What is a typical day like?)

Time marker (present)	Activities (present)
<b>Normalmente</b> (normally)	<b>escribo correos</b> (I write emails)
<b>Todos los días</b> (every day)	<b>hago reservas</b> (I make reservations)
<b>Siempre</b> (always)	<b>hago entrevistas</b> (I do interviews)
<b>Nunca</b> (never)	<b>organizo excursiones</b> (I organise excursions)
	<b>preparo el programa</b> (I prepare the programme)
	<b>salgo con los grupos</b> (I go out with the groups)
	<b>trabajo con mi equipo</b> (I work with my team)
	<b>viajo mucho</b> (I travel a lot)
	<b>voy a la oficina</b> (I go to the office)
	<b>hablo con clientes</b> (I talk to customers)
Time marker (past)	Activities (past)
<b>Ayer</b> (yesterday)	<b>conocí a...</b> (I met...)
<b>El año pasado</b> (last year)	<b>fui a...</b> (I went to...)
<b>La semana pasada</b> (last week)	<b>hablé con...</b> (I spoke to...)
	<b>organicé una visita para...</b> (I organised a visit for...)
	<b>preparé un programa especial</b> (I prepared a special programme)
	<b>viajé en helicóptero</b> (I travelled by helicopter)



<u>¿Te gusta tu trabajo?</u> (Do you like your job?)	
<b>Me encanta mi trabajo porque...</b> (I love my job because it is...)	<b>es muy variado</b> (it's very varied)
	<b>es muy práctico</b> (it's very practical)

<u>¿Qué idiomas hablas?</u> (What languages do you speak?)
<b>Hablo español, inglés y alemán</b> (I speak Spanish, English and German)
<b>Los idiomas son importantes</b> (Languages are important)

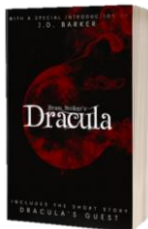


# Yr9 Term 1 Challenges

These are **optional** additional homework tasks you can complete to earn achievement points. Show your form tutor!

## English

Create a front cover and back cover for your own Gothic Novel.



The front cover must have the title and imagine that gives the reader good idea about the book is about. The back cover must have a short introduction to your novel to get the potential reader hooked!

Show your book cover to your English teacher

1hr of CU Credits

## History

Choose one of the key battles from World War 1. Research this battle and produce an A4 report on what happened and it's impact on the First World War



Show your report to your history teacher

1hr of CU Credits

## Drama

Create an A4 page character study of a chapter from your favourite film of TV show.



You must include; what their role is in the film/show, what their personality is like and how the actor manages to get this across to the audience

Show it to you drama teacher

1hr of CU Credits

## Music

Go onto YouTube and watch a performance by Bessie Smith, BB King and Muddy Waters.

Write a review of each song explaining what it was about, what instruments were used and what you thought of it. Say which of the three song you liked the most and why

Show your work to your music teacher

1hr of CU Credits



## Art

Choose your favourite film, tv or sports star. Use the rules you have learnt about portraiture to draw a portrait of this person.

Show it to your art teacher

1hr of CU Credits



## Spanish

With a partner write a short sketch set in a restaurant where one person plays the waiter and the other plays a customer ordering food, all in Spanish.

Film your sketch with props and costumes and show it to your Spanish teacher along with the script written in Spanish.



1hr of CU Credits each

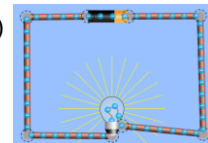
## Science

Use the following website to create your own circuits.

[https://phet.colorado.edu/sims/html/circuit-construction-kit-ac/latest/circuit-construction-kit-ac\\_en.html](https://phet.colorado.edu/sims/html/circuit-construction-kit-ac/latest/circuit-construction-kit-ac_en.html)

(click on AC construction)

Once you have practiced creating one series and one parallel circuit design a circuit which has two lights, each of which can be switched on and off independently of each other.



Take a picture of your circuit and explain how it works. Show your work to your science teacher

1hr of CU Credits

## Food and Nutrition

Go onto the McDonalds website <https://www.mcdonalds.com/gb/en-gb/menu.html>

Draw out this table and find the nutritional information to complete it

Item	Energy (Kcal)	Fat (g)	Sugar (g)	Salt (g)
Big Mac				
Large fries				
Cheesy Garlic bites				
Coca Cola classic				
Mars McFlurry				
Total				

When you have finished use the website to suggest healthier alternatives and explain why these are better for you

Show your technology teacher your work

1hr of CU Credits