



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 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 anything off!

Create a timeline of 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 key words 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 successfully 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.

Create a spelling list from the keywords. Look, cover, write, check and correct until
you 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.



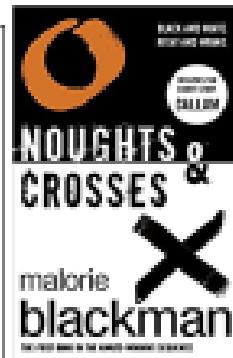
English

Y9 Autumn Term

Noughts and Crosses

Plot Overview

Sephya 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.'

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:

Sephya 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'

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?



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*



Key Sentence Types

Three Verb Sentence

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

Not, Nor, Nor Sentence

Not a single animal, not 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.

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**



English

Noughts and Crosses

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 0.1	0.01 0.01

0.30
0.23

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

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

We say "nought point five two"

Five tenths and two hundredths

ones	Tenths	hundredths
	• 0.5 0.5 0.2	0.01 0.01

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

Round to powers of 10 & 1 significant figure

5495 to the nearest 1000



5475 to the nearest 100



5475 to the nearest 10



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 24 or 25



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



2.4 | 6 | 9 | 2 This shows the number is closer to 2.5

2.4 | 6 | 1 | 9 | 2 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

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

The equal sign changes to show it is an estimation

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.

Order of operations

R

Brackets Operations in brackets are calculated first.

Other operations eg 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

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



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 $-3 + 2y$

Factorise linear expressions

Fully factorise: 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	
3	$3 \times 2x$	3×4
$6x$	12	

$6x + 12$

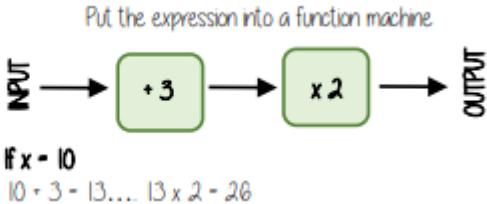
$2x + 4$	$2x + 4$	$2x + 4$
$x \times x$	4	$x \times x$
$6x + 12$		

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

Substitution into expressions

$$2(x + 3)$$

Odd 3 to the input then times 2



Form expressions

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

More than – ADD

Less than/ difference – SUBTRACT

$$\begin{aligned} \text{e.g. } 4 \text{ more than } t &\rightarrow t + 4 \\ 8 \text{ less than } k &\rightarrow k - 8 \end{aligned}$$

Only similar terms can be grouped together

$$\begin{aligned} t &\quad \text{Find the perimeter of this shape} \\ 2t + 1 &\quad (\text{Perimeter} = \text{length around outside of shape}) \\ t + 2t + 1 + t + 2t + 1 &\rightarrow 6t + 2 \end{aligned}$$

Expand double brackets

Expand & Simplify:

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

$$\begin{array}{c} \downarrow \\ x \quad x + 2 \\ \times \quad \boxed{x^2} \quad + 2x \\ + 3 \quad + 3x \quad + 6 \end{array}$$

$$\begin{array}{c} \downarrow \\ x^2 + 2x + 3x + 6 \end{array}$$

$$\begin{array}{c} \downarrow \\ x^2 + 5x + 6 \end{array}$$



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

- $2^2 \times 2^3 = 2 \times 2 \times 2 \times 2 \times 2 = 2^5$
- $k^4 \times k^2 = k \times k \times k \times k \times k \times k = k^6$

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

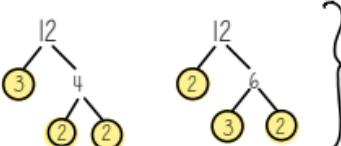
Examples

$$\begin{aligned} 5^3 \div 5 &= \frac{5 \times 5 \times 5}{5} \\ &= 5^2 \end{aligned} \quad \begin{aligned} d^5 \div d^2 &= \frac{d \times d \times d \times d \times d}{d \times d} \\ &= d^3 \end{aligned}$$

Product of Prime Factors

Example 1

Write 12 as a product of its prime factors

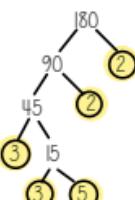


Both of these trees represent the same decomposition

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

Example 2

Write 180 as a product of its prime factors



$$\begin{aligned} 180 &= 2 \times 2 \times 5 \times 3 \times 3 \\ &= 2^2 \times 3^2 \times 5 \end{aligned}$$

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 its prime factors, how does that help us to write 36 as a product of its 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 10×12 so we can say $120 = 2 \times 2 \times 3 \times 10$

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

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

$$8^{-\frac{1}{3}} = \frac{1}{8^{\frac{1}{3}}} \quad \text{Remember this means the cube root of 8!}$$

EXAMPLE 2

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

$$= \frac{1}{5^3}$$

$$= \frac{1}{125}$$

EXAMPLE 3

$$\begin{aligned} (343x^9)^{-\frac{2}{3}} \div x^3 &\quad \text{Don't forget the order of operations!} \\ &= \frac{1}{(343x^9)^{\frac{2}{3}}} + x^3 \\ &= \frac{1}{(7x^3)^2} + x^3 \\ &= \frac{1}{49x^6} \times \frac{1}{x^3} = \frac{1}{49x^9} \end{aligned}$$

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, 64, 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

$$\text{So } \sqrt{24} = \sqrt{4 \times 6} \\ = \sqrt{4} \times \sqrt{6} \\ = 2\sqrt{6}$$

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

$$\text{Simplify } \sqrt{96}. \\ \text{So } \sqrt{96} = \sqrt{6 \times 16} \\ = \sqrt{6} \times \sqrt{16} \\ = 4\sqrt{6}$$

Expanding Brackets

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

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

$$= 2\sqrt{3} + \sqrt{18} \\ = 2\sqrt{3} + \sqrt{9} \times \sqrt{2} \\ = 2\sqrt{3} + 3\sqrt{2}$$

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

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

$$24 = 2 \times 2 \times 2 \times 3 \\ \text{So } \sqrt{24} = \sqrt{2} \times \sqrt{2} \times \sqrt{2} \times \sqrt{3} \\ = 2 \times \sqrt{2} \times \sqrt{3} \\ = 2\sqrt{6}$$

$$\sqrt{18} = \sqrt{9} \times \sqrt{2} \\ = 3\sqrt{2}$$

Always remember to check if you can simplify your surds

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	$\cdot \sqrt{3}$
$\sqrt{2}$	$\sqrt{2}$	$\sqrt{6}$

$$= 3\sqrt{24} - 2\sqrt{6} \\ = 6\sqrt{6} - 2\sqrt{6} \\ = 4\sqrt{6}$$

none of these are like terms so we cannot simplify anymore

Adding and Subtracting Surds

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

coefficients are dealt with just like they are in algebra

$$4\sqrt{3} + 7\sqrt{3} = 11\sqrt{3}$$

$$8\sqrt{2} - 5\sqrt{2} = 3\sqrt{2}$$

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

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

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

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

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

Multiplying and Dividing Surds

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

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

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

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

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

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

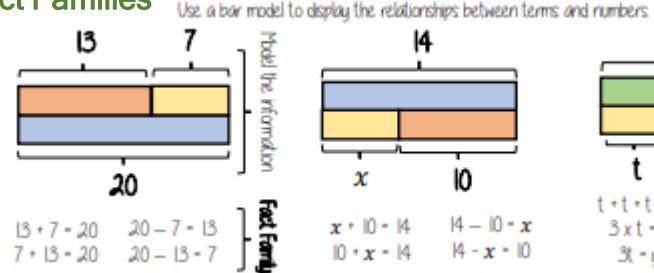
- Integer:** a whole number
- Rational Number:** a number which can be expressed in the form $\frac{a}{b}$, where a and b are integers
- Irrational Number:** a number which cannot be expressed in the form $\frac{a}{b}$, where a and b are integers
- Expand:** multiply out the brackets
- Square Number:**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



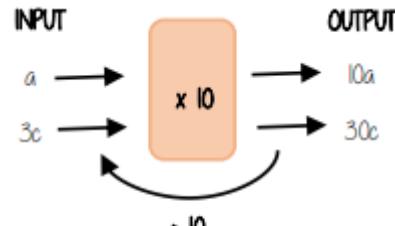
MATHS

Rearranging formulae

Fact Families

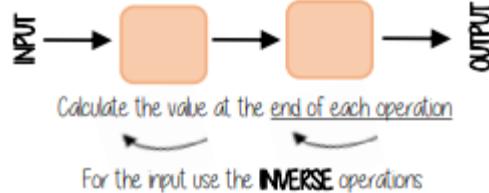


One step function machines

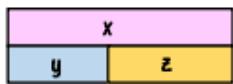


To find the input from the output.
Use the **INVERSE** operation

Two step function machines



Rearranging formulae (one step)



$$x = y + z$$

Rearrange to make y the subject
 $y = x - z$

$$\begin{array}{ccc} y & \rightarrow & +z \\ & \leftarrow & -z \\ y & \rightarrow & x \end{array}$$

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

Rearranging can also be checked by substitution

Language of rearranging...

Change the subject

Rearrange

Further examples

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

$$\begin{aligned} 4 - 2y &= 2y + 3u \\ (+2y) &\quad (+2y) \\ 4 &= 4y + 3u \\ (-3u) &\quad (-3u) \\ 4 - 3u &= 4y \\ (\div 4) &\quad (\div 4) \\ y &= \frac{4 - 3u}{4} \end{aligned}$$

Make p the subject of:
 $m = (p - y)^2$

$$\begin{aligned} m &= (p - y)^2 \\ (\sqrt{}) &\quad (\sqrt{}) \\ \pm\sqrt{m} &= p - y \\ (+y) &\quad (+y) \\ y \pm \sqrt{m} &= p \\ p &= y \pm \sqrt{m} \end{aligned}$$

Make n the subject of:
 $an - 2n = b^2$

$$\begin{aligned} an - 2n &= b^2 \\ (factorise) &\quad (factorise) \\ n(a - 2) &= b^2 \\ (\div(a-2)) &\quad (\div(a-2)) \\ n &= \frac{b^2}{a - 2} \end{aligned}$$

Rearranging formulae (two step)

In an equation (find x)

$$\begin{aligned} 4x - 3 &= 9 \\ +3 &\quad +3 \\ 4x &= 12 \\ \div 4 &\quad \div 4 \\ x &= 3 \end{aligned}$$

In a formula (make x the subject)

$$\begin{aligned} xy - s &= a \\ +s &\quad +s \\ xy &= a + s \\ \div y &\quad \div y \\ x &= \frac{a + s}{y} \end{aligned}$$

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 $A = b \times h$

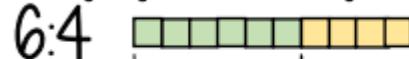


MATHS

Ratio and Proportion

Simplifying a Ratio

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



$$\downarrow \text{by 2}$$



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

Cancel down the ratio to its lowest form



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

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

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
 \downarrow
1 can is £0.30
Or 30p

Cost per item

Shop B
3 cans for 93p
 \downarrow
1 can is £0.31
Or 31p

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



Shop A
4 cans for £1.20
 \downarrow
£1 buys 3.333 cans of pop

Cost per pound

3 cans for 93p
 \downarrow
£1 buys 3.23 cans of pop

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

Direct Proportion



$$4 \text{ cans of pop} = \text{£2.40}$$

$$\times 2 \quad \text{4 cans of pop} = \text{£2.40} \quad \times 2 \quad \text{2 cans of pop} = \text{£1.20}$$

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

This is a multiplicative change

$$\times 3 \quad \text{4 cans of pop} = \text{£2.40} \quad \times 3 \quad \text{12 cans of pop} = \text{£7.20}$$

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

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



James: Lucy

Sharing in a Ratio

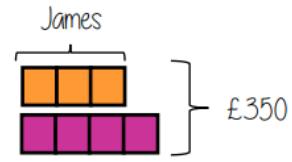
James and Lucy share £350 in the ratio 3:4.

Work out how much each person earns

Model the Question

James: Lucy

$$3 : 4$$



James

Lucy

$$\text{£350} \div 7 = \text{£50}$$

\square = one part
= £50

Find the value of one part

Whole: £350

7 parts to share between
(3 James, 4 Lucy)

Put back into the question

James: Lucy

$$\times 50 \quad 3 : 4 \quad \times 50 \quad \text{£150 : £200}$$

$$\text{James} = 3 \times \text{£50} = \text{£150}$$



$$\text{Lucy} = 4 \times \text{£50} = \text{£200}$$

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

$\div 2$	$\times 4$
T	1
G	40

$\times 2$ $\div 4$

2	20
5	8

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 ones where the difference between each term is the same

$$1, 2, 3, 4, 5, \dots \quad 2, 5, 8, 11, \dots \quad 5, 10, 15, 20, \dots$$

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

$$2, 4, 6, 8, \dots \quad 10, 30, 90, 270, \dots \quad -3, -6, -12, -24, \dots$$

Finding the nth term

Example

Find the nth term of the sequence

$$2, 5, 8, 11, 14, \dots$$

1. Find the term-to-term rule

$$\begin{array}{ccccccc} 2 & 5 & 8 & 11 & 14 & \dots \\ \curvearrowup_3 & \curvearrowup_3 & \curvearrowup_3 & \curvearrowup_3 & & \end{array}$$

2. Write out the times table of that common difference

$$3, 6, 9, 12, 15, \dots$$

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

$$\begin{array}{ccccccc} 3 & 6 & 9 & 12 & 15 & \dots \\ \curvearrowleft_1 & \curvearrowleft_1 & \curvearrowleft_1 & \curvearrowleft_1 & & \end{array}$$

$$2, 5, 8, 11, 14, \dots$$

the nth term is:

$$3n - 1$$

The Language of Sequences

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

$$1, 3, 5, 7, 9, 11, \dots$$

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

The second term of this sequence is 3

Using the nth term

Example

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

$$1^{\text{st}} \text{ term: } 4(1) + 1 = 5$$

$$2^{\text{nd}} \text{ term: } 4(2) + 1 = 9$$

$$3^{\text{rd}} \text{ term: } 4(3) + 1 = 13$$

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

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

Find the 12th term in the sequence $3n - 4$?

$$3(12) - 4 = 36 - 4 = 32$$

nth term

The 12th term of the sequence $3n - 4$ is 32

Using the term to term rule

Example 1

$$\begin{array}{ccccccc} 2 & 5 & 8 & 11 & 14 & \dots \\ \curvearrowup_3 & \curvearrowup_3 & \curvearrowup_3 & \curvearrowup_3 & & \end{array}$$

The term-to-term rule is
 $\times 3$

Example 2

$$\begin{array}{ccccccc} 2 & 4 & 8 & 16 & \dots \\ \curvearrowup_2 & \curvearrowup_2 & \curvearrowup_2 & & \end{array}$$

The term-to-term rule is
 $\times 2$

Special Sequences

Triangular Numbers

$$1, 3, 6, 10, 15, \dots$$



Square Numbers

$$1, 4, 9, 16, 25, \dots$$



Fibonacci sequence

$$1, 1, 2, 3, 5, 8, \dots$$

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

B5 Field study

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

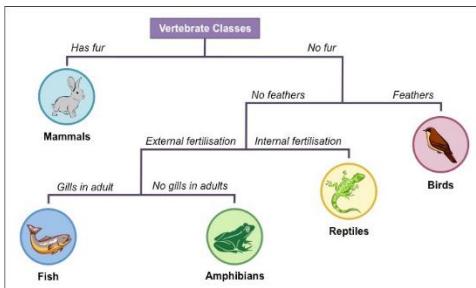
A **transect** is a line across a **habitat** or part of a habitat. It can be as simple as a string or rope placed in a line on the ground. The number of organisms of each **species** along a transect can be observed and recorded at regular intervals



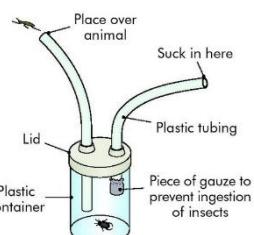
Dichotomous keys

A series of questions to identify an unknown organism

Starting with the 1st 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

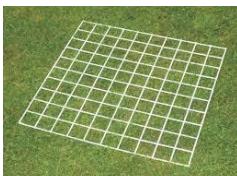


Pitfall trap

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

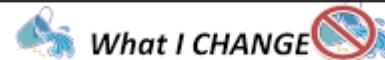
PS1 practical skills

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

Variables

INDEPENDENT VARIABLE



DEPENDENT VARIABLE

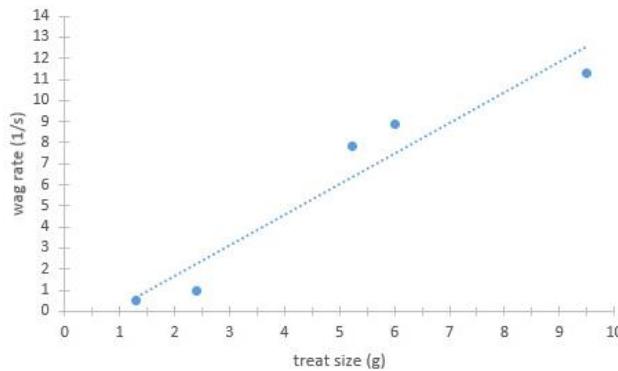


CONTROLLED VARIABLE

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

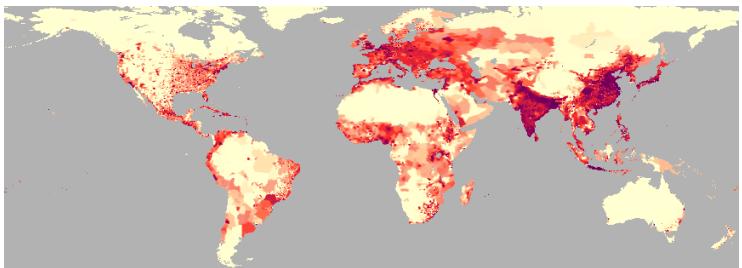
Hazard – an item that can cause harm	Risk – how it causes harm	Precaution – how to prevent harm
Eg Hydrochloric acid	Corrosive	Wear goggles, rinse off skin if there is contact



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

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.

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.

DECREASE

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

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

INCREASE

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

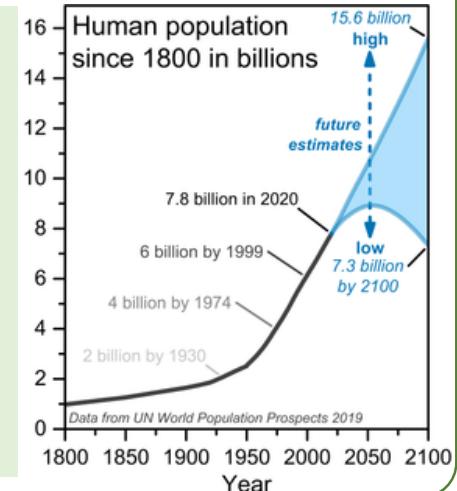
World population growth

World population has increased rapidly since 1960.

In HIC's the growth is steady

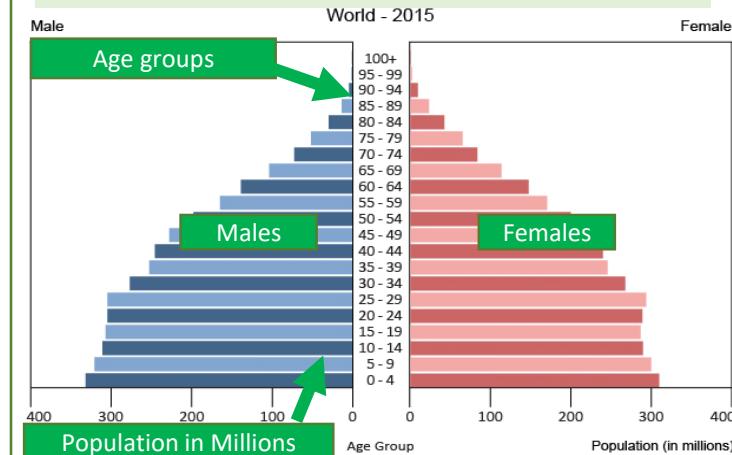
In NEE's the growth is rapid

In LIC's the growth is increasing rapidly



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

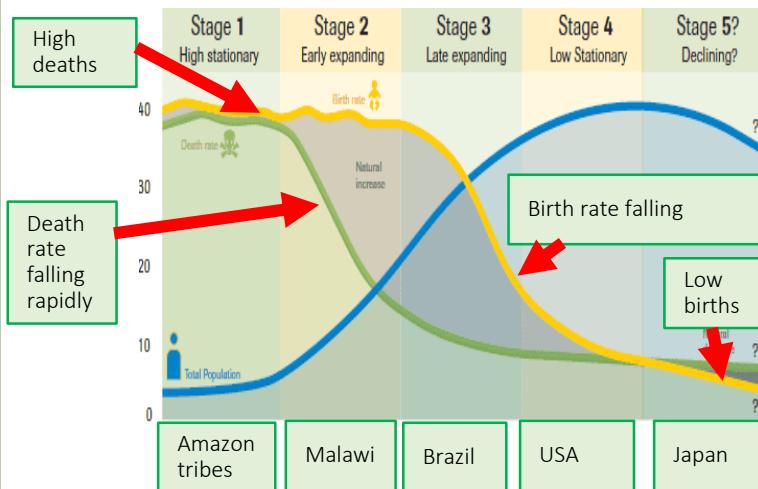


Geography

Key terms

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

The Demographic Transition model



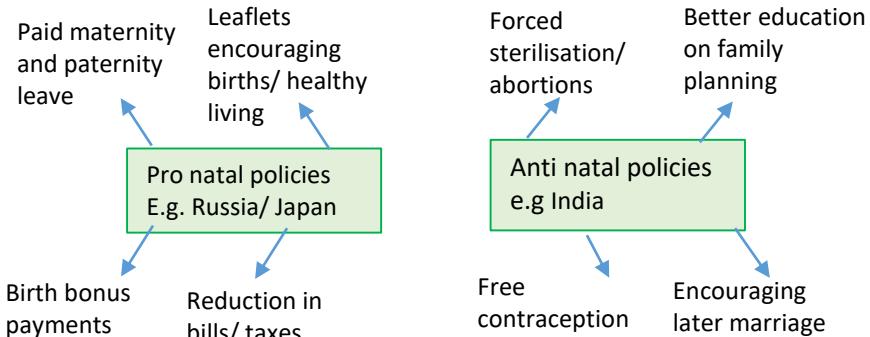
As a country develops it's population changes.

- 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.

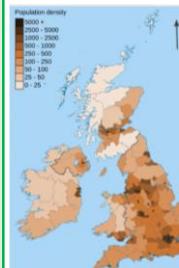
Autumn 1: World population

Population policies



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

Opportunities	Challenges
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.
SOCIAL	ECONOMIC
	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

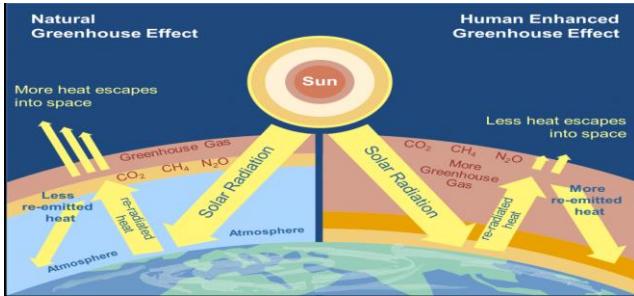
Global Issue

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.



Human causes of global warming



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

Deforestation (chopping down forests) means less CO₂ is recycled by nature

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

Vehicles produce around 20% of global CO₂ emissions

Power generation using fossil fuels creates about 30% of global CO₂ emissions

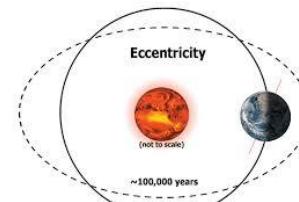
Industry uses a lot of fossil fuels in manufacturing

Animals and humans all breathe out CO₂

Natural causes of global warming

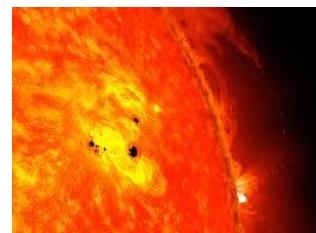
Volcanic eruptions

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



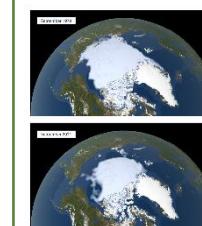
Sun spots

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

Evidence of global warming

Ice cores

Measure the past CO₂ 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

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



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	Economic impacts	Environmental impacts
Homelessness Sea water contaminating freshwater	Loss of tourism and jobs Loss of airport Costly coastal defences	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

Managing climate change

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



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

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.

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:

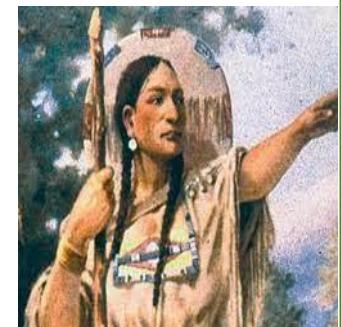
General Custer



Sitting Bull



Sacagawea





Art

Independent Study Tasks

IDENTITY

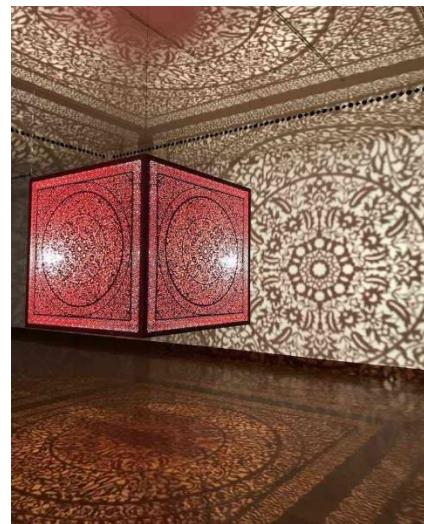
Independent Study Task One:
Analysis Questions: On the PPT template provided on your Teams page, answer the questions for EACH of the art works shown

- 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)

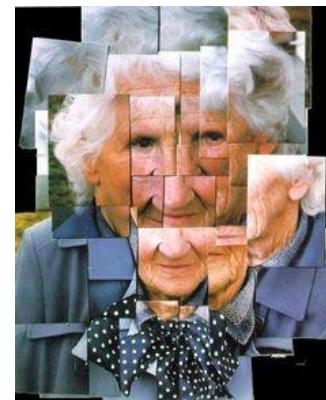


Molly Crabapple, "Portraits of myself and Lola Montes with things said about us by our contemporaries", 2014

[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

With precision $\text{♩} = 128$

Cm Cm/Eb F#m Ab Gm

Sweet dreams are made of this, —

3 5 5 5 2 1

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:

Treble Clef Staff: D, E, F, G, A, B, C, D, E, F, G

Bass Clef Staff: G, A, B, C, D, E, F, G, A, B

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'.

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

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

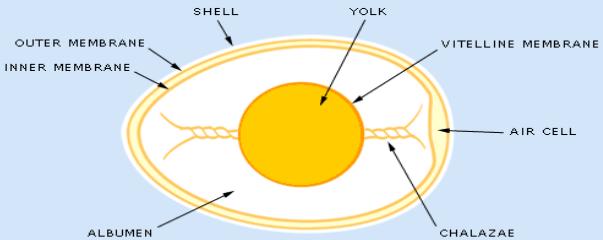
Samples: A pre-recorded piece of music or sound from another artist that you use in your own song



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.

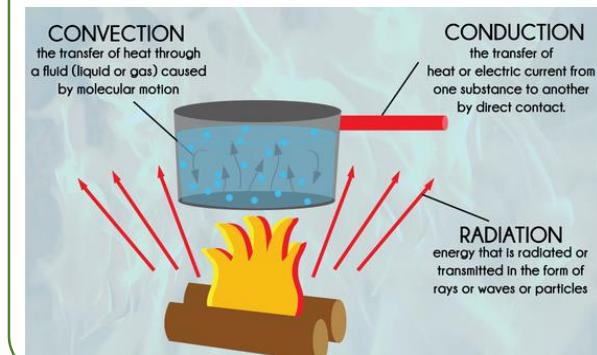


The Science of cooking

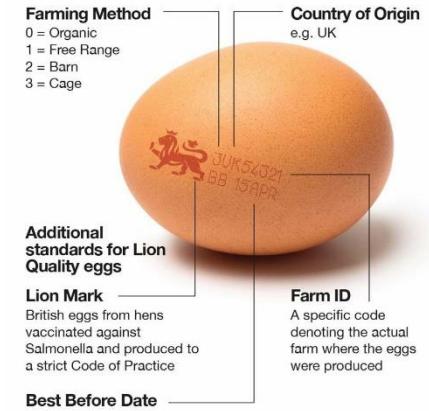
Key Words

Coagulation	An irreversible change to proteins from a liquid or semi-liquid state to a solid state.
Denature	The process of altering a protein's molecular characteristics or properties by heat, enzyme action or chemicals.
Free Range	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.
Organic	A technique, which involves the cultivation of plants and rearing of animals in natural ways
Conduction	The transfer of heat or electric current from one substance to another by direct contact.
Convection	The transfer of heat through a fluid (liquid or gas) caused by molecular motion.
Radiation	Energy that is radiated or transmitted in the form of rays or waves or particles.

Methods of Heat Transfer

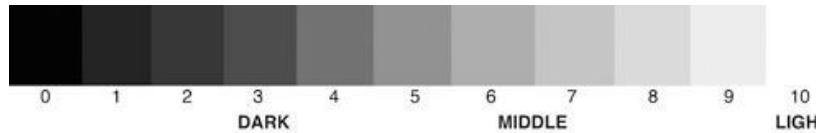


Egg printing explained





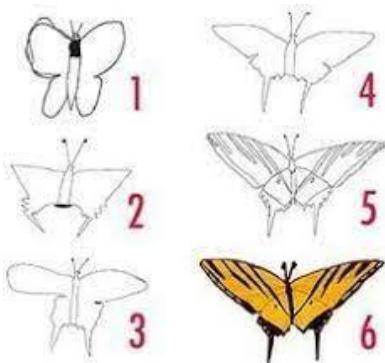
Graphics



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.

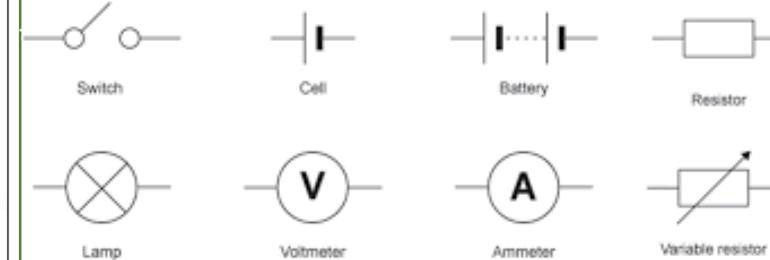
Overview
More Complex Switches and Circuits

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).

Circuit Diagrams



Keywords

Circuits	An electrical circuit is a complete route that an electric current can flow around
Refinement	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.
Tone	This is the amount of dark or light you use when shading.
Construction Lines	These are lines that will help you to create an accurate drawing.
Typography	This is the use of font that you choose to use.

Evaluating your Designs

Even small **developments** should be evaluated.

Developments could include:

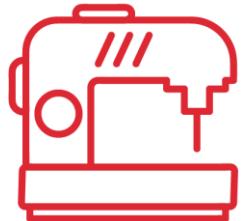
- Shape
- Colour
- Texture
- Layers
- Imagery
- Fonts
- Size
- Line



Annotation



Textiles



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



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



Applique



Textiles Techniques

Appliquéd 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

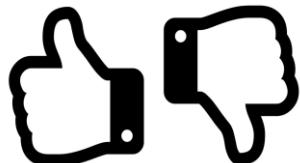


¿Qué cosas te gustan? (What things do you like?)

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 interesa (it interests me)
Me encanta (I love)	el cine (cinema)		me fascina (it fascinates me)
Me chifla (I love)	el deporte (sport)		me hace sonreír (it makes me smile)
Me mola (I love)	el dibujo (art)		me aburre (it bores me)
Me flipa (I love)	el teatro (the theatre)		me pone triste (it makes me sad)
No me gusta (I dislike)	el racismo (racism)		me da rabia (it makes me angry)
No me gusta nada (I really don't like)	la moda (fashion)		
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)
Mi madre (my mum)	odia (hates)	la naturaleza (nature)
	detesta (hates)	la pesca (fishing)
		la violencia (violence)
	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 nadan (loves)	las tareas domésticas (chores)
Mi madre (my mum)	odia (hates)	
	detesta (hates)	



Spanish



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 → I speak





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... (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

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)



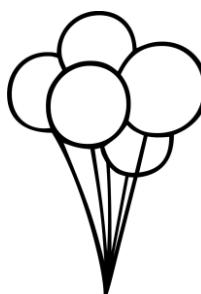
¿Cómo fue tu cumpleaños? (How was your birthday?)

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)	
Recibí muchos regalos (I received lots of presents)	¡Me encantó! (I loved it!)

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)
Fuliste (you (s) went)
Fue (he/she went)
Fulimos (we went)
Fulisteis (you (pl) went)
Fueron (they went)





Spanish



¿En qué trabajas? (What's your job?)

Jobs	Responsibilities
Soy (I am) camarero/a (a waiter) cocinero/a (a cook) dependiente/a (a shop assistant) jardinero/a (a gardener) limpiador(a) (a cleaner) peluquero/a (a hairdresser) receptionista (a receptionist)	Tengo que... (I have to...) ayudar a los clientes (help the customers) cortar el pelo a los clientes (cut the customer's hair) contestar al teléfono (answer the phone) hablar por teléfono (speak on the phone) hacer manicuras (do manicures) limpiar habitaciones (clean rooms) 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) organizado/a (organised)
Creo/pienso que soy... (I believe/think I am)	bastante (quite) 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 horrorosos (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...)	trabajar al aire libre (to work in the open air) trabajar con animales (to work with animals) trabajar con niños (to work with children) trabajar en equipo (to work in a team) trabajar en una oficina (to work in an office) trabajar solo/a (to work alone) hacer un trabajo creativo (to do a creative job) hacer un trabajo manual (to do a manual job)	Por eso me gustaría ser... (Therefore I would like to be...)
No me gustaría (nada)... (I wouldn't like (at all)....)	Quiero ser... (I want to be)	abogado/a (a lawyer) 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) policía (a police officer) taxista (a taxi driver)





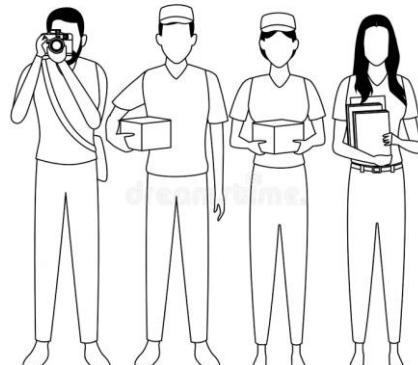
Spanish



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



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

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

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

Me encanta mi trabajo porque... (I love my job because it is...)

es muy variado (it's very varied)

es muy práctico (it's very practical)

¿Qué idiomas hablas? (What languages do you speak?)

Hablo español, inglés y alemán (I speak Spanish, English and German)

Los idiomas son importantes (Languages are important)

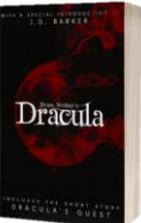


Yr9 Term 1 Challenges

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 or 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 your 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 songs 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



Show your report to your history teacher

1hr of CU Credits

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

(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