



WINTERSTOKE
HUNDRED
ACADEMY

Knowledge Organisers



Term 3 and 4
Year 9

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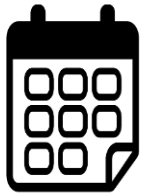
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Computer Science

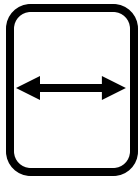
How to revise

Successful Learning Takes Place Over Time

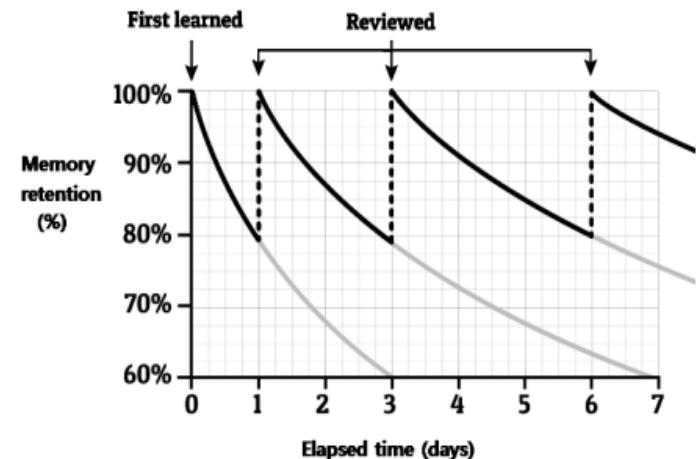


It's rare for anyone to be completely comfortable with something they learn for the first time. This could be a new piece of music, dance move, language or chemistry. We all have to practice. In most instances, the aim is to be at your optimum on the day it matters, e.g. the performance, race or exam. Everything leading up to this point is part of the process of improving. It's about the long-term rather than the short-term, which also means there are no quick fixes. During this period, it's okay to make mistakes; it's okay to feel frustrated. What matters is what you do about it.

Space out your learning on a subject



Spacing out your learning over time is far more effective than last-minute cramming. This is based on research into how we forget and how we remember. The speed at which we forget something will depend on many factors such as the difficulty of the material, how meaningful it was to us, how we learned it and how frequently we relearn or remember it. The last factor tells us that when we learn something for the first time, we need to review it quickly afterwards. The more times we force ourselves to remember something, the longer the gap between reviews, which the diagram below illustrates nicely. The Leitner system and Cornell Notes mentioned earlier provides a wonderful way of achieving this, but the principle applies to all of the learning strategies mentioned in this booklet



Revision strategies

List It



This is a simple free recall task that is very versatile. It can feel challenging, but this is a good thing, and it provides clear feedback on what you do and don't know. Choose a topic, set yourself a time limit and...

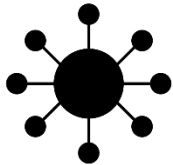
- List as many keywords as you can
- List as many facts as you can
- List as many key events/quotes/individuals as you can
- List as many causes of X as you can
- List as many consequences of Y as you can

Flashcards



Flashcards have the potential to be a powerful learning aid. However, how successful this is will depend on the thought you put into making them in the first place and then how they're used. It's very important to remember that they're for testing, not summarising

Mapping



Mapping is a brilliant way of organising and learning information, demonstrated on various pages in this booklet. It helps you break down complex information, memorise it, and see the connections between different ideas.

Self-testing



Research has shown that every time you bring a memory to mind, you strengthen it. And the more challenging you make this retrieval, the greater the benefit. Self-testing improves the recall of information, transfer of knowledge and making inferences between information. Equally, there are many indirect effects, such as a greater appreciation of what you do and don't know, which helps you plan your next steps.

Flashcards



Flashcards are small sheets of paper or card with matching pieces of information on either side. They are a useful tool for learning facts and allow you to quickly check whether you have remembered something correctly.

When making and using flashcards:

Do:

- ✓ ...make flashcards quickly.
- ✓ ...put a single piece of information of each flashcard.
- ✓ ...sort your flashcards according to your confidence with them (see below).
- ✓ ...test yourself on the flashcards from memory.

Don't:

- X ...spend more time making flashcards than actually using them.
- X ...put lots of information onto each flashcard.
- X ...revise the flashcards in the same order every time that you use them.
- X ...only read through flashcards.

1861	groynes	osmosis	Where is the pharmacy?
Pasteur published his paper about germ theory.	A low wall on the coastline which slows longshore drift	Net movement of water from a high concentration to low concentration across a partially permeable membrane	Où est la pharmacie?

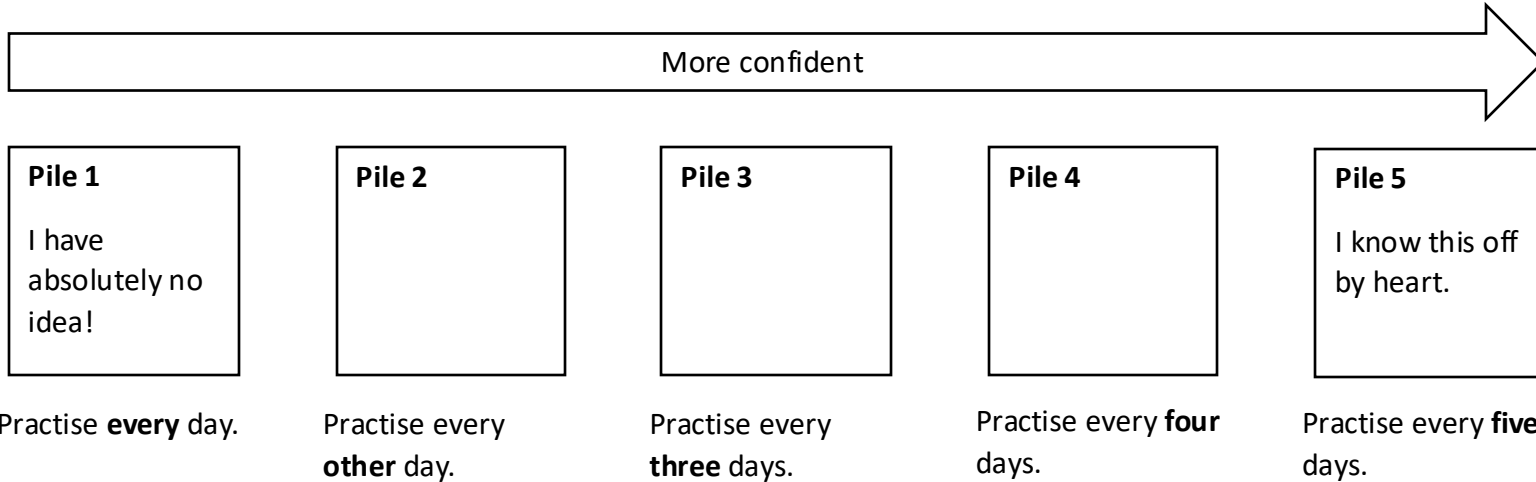
How to make flashcards:

- You can buy a set of flashcards or use a free website such as Quizlet.
- Find the information you want to put onto flashcards using your existing revision resources (e.g. a knowledge organiser).
- Fold a piece of A4 paper into 10.
- Write the questions on the top half of the paper.
- Write the answers on the bottom half of the paper.
- Cut the paper along the dotted lines shown here.
- Fold the strips of paper so that the writing is on either side.

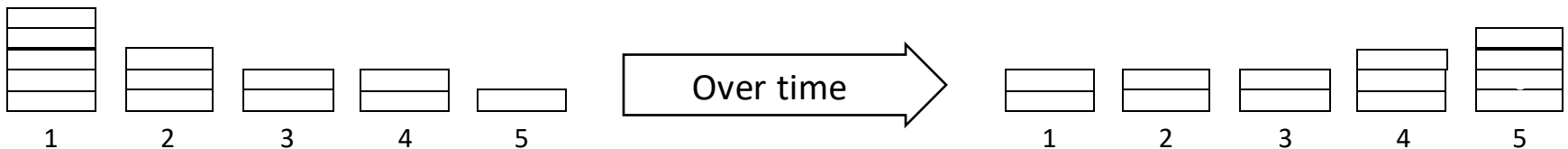
Definition 1	Definition 2	Definition 3	Definition 4	Definition 5
Answer 1	Answer 2	Answer 3	Answer 4	Answer 5

How to use flashcards:

1. Test yourself using the flashcards.
2. As you test yourself, sort the flashcards into up to five piles according to how confident you are with the content.
3. Put the piles into numbered envelopes (1-5).
4. Test yourself on the different piles on different days (see below):



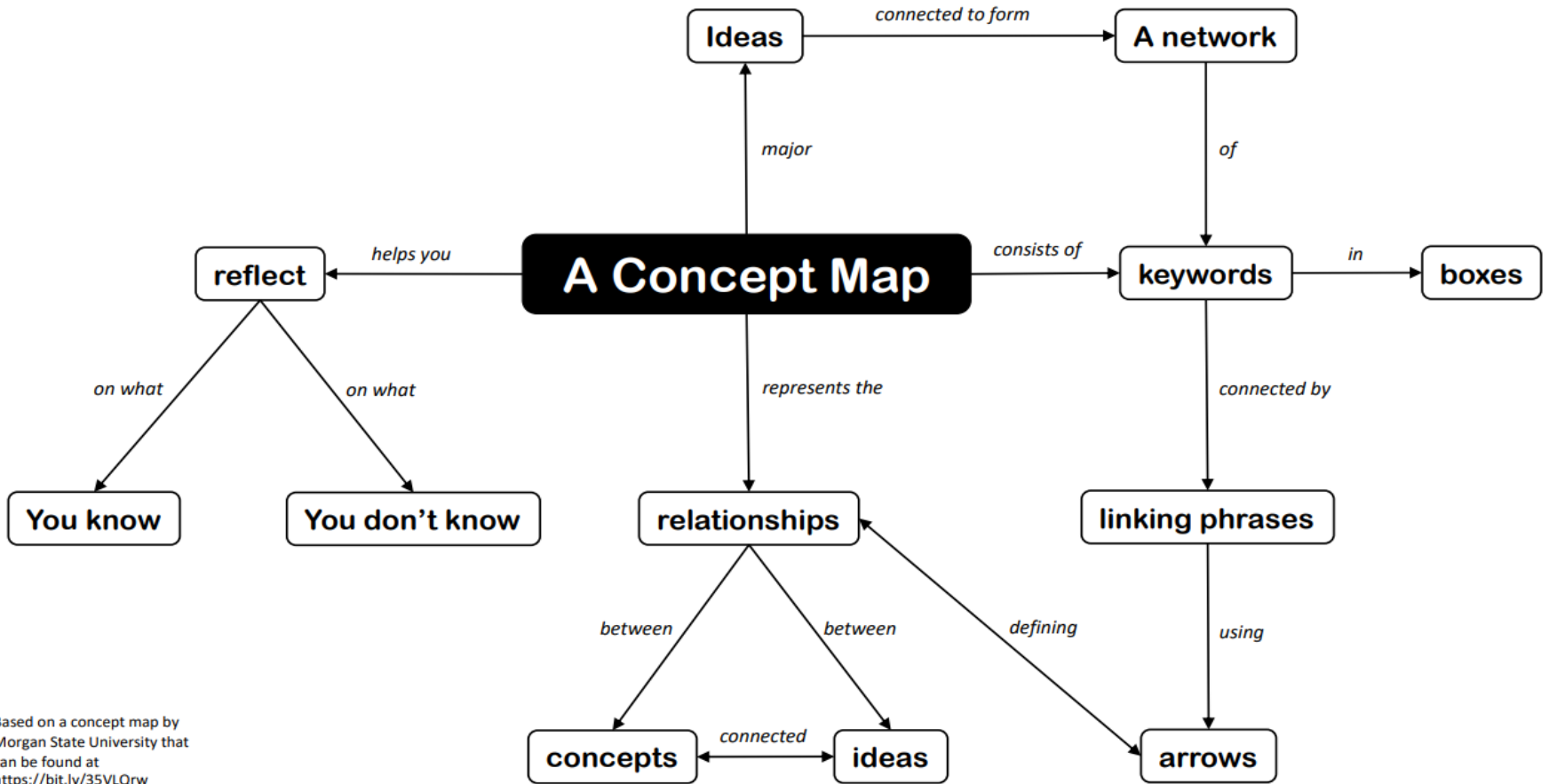
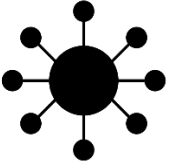
5. As you test yourself on the different piles, move the cards into different piles as you become more confident



Useful resources:

www.quizlet.com – This free website allows you to quickly create flashcards which you can print, use on a computer, or use on your phone.

Mapping



Based on a concept map by Morgan State University that can be found at <https://bit.ly/35VLQrw>

War of the Worlds

Context
<ul style="list-style-type: none"> Written in 1898 when the British Empire was the most dominant colonial power on earth. Queen Victoria died in 1901 In the 19th century there was a very real fear that an apocalypse could begin. Fears included the fear of mass immigration from other parts of the British Empire HG Wells was an author of science fiction HG Wells used the novel to explore his own reservations about imperialism

Modern Context of Space Exploration
<ul style="list-style-type: none"> Space exploration is the investigation by a crew or by machines of the reaches of the universe beyond Earth's atmosphere. The use of the information gathered should benefit all humankind.

The characters			
The Narrator	He is courageous but he is occasionally overcome by fear.	The Martians	The technologically advanced aliens who invade Earth.
Henderson	A journalist from London.	Ogilvy	A well-known astronomer and friend of the Narrator
Stent	The Astronomer Royal.	The Curate	An unnamed man of the cloth and foil to the Narrator..

The plot Book 1	
Ch 1 The Eve of the War	<ul style="list-style-type: none"> During the last few years of the nineteenth century, Earth was being watched closely by a higher intelligence on Mars. The Narrator meets Ogilvy, an astronomer, and visits his observatory outside of Ottershaw. The two look at Mars through the telescope and see the venting of gases. They do not know that they are seeing the launch of projectiles toward Earth. While the projectiles travel toward Earth, life goes on peacefully,
Ch 2 The Falling Star	<ul style="list-style-type: none"> A falling star is seen over Winchester. Ogilvy investigates and finds the crash site of a large metal cylinder in Horsell Common. It is still extremely hot, so he is unable to get very close. Ogilvy does notice that the end which protrudes from the ground is slowly rotating. He runs to town, but people dismiss his story. He finds a London journalist, Henderson, and convinces him to come to the crash site. Finding that the cylinder has stopped moving, they return to town, where Henderson telegraphs the newspaper. When the Narrator reads of the crash site in his newspaper, he travels from his home in Woking to Horsell Common.
Ch 3 On Horsell Common	<ul style="list-style-type: none"> The Narrator arrives at the cylinder's crash site, where a small crowd has gathered at the edge of the crater. The table-sized end cap is no longer rotating, but he notices a yellowish-white metal between the cap and the cylinder. He believes that the cylinder must be full of information from Mars, and not living beings. He goes home.
Ch 4 The Cylinder Opens	<ul style="list-style-type: none"> The Narrator returns at sunset. Several hundred people have gathered. He elbows his way through the crowd and hears Ogilvy yelling to keep everyone back, since no one knows what is inside the cylinder. The end of the cylinder twists itself off and the Narrator stares into the dark emptiness of the cylinder. Gray tentacles, the thickness of a walking-stick, emerge from the cylinder, followed by a "rounded bulk" the size of a bear. The crowd has almost entirely dispersed, but he can no longer see what is happening in the pit around the cylinder.

Key Words

Colonialism	the policy or practice of acquiring full or partial political control over another country, <u>occupying</u> it with <u>settlers</u> , and <u>exploiting</u> it economically.
Imperialism	a policy of extending a country's power and influence through <u>colonization</u> , use of military force, or other means.
Literary heritage	Key texts that define a country's background and are seen as key texts worthy of study
Exodus	A mass departure of people
Evolution	The gradual development of something
Pulsate	To expand and contract in regular intervals
Astronomy	The branch of science that deals with objects in the sky such as planets and stars
Bulk	The mass or size of something
Steadfast	To not change or waver
Convulse	Violent movement of the muscles which causes the body to distort
Tumultuous	Making an uproar or loud, confused noise
Oppression	Prolonged cruel or unjust treatment or exercise of authority
Exploitation	To treat someone unfairly to benefit from their work

Key Quotes

Ch 1: With infinite complacency men went to and fro over this globe about their little affairs, serene in their assurance of their empire over matter.
Ch 2: The Thing itself lay almost entirely buried in sand, amidst the scattered splinters of a fir tree it had shivered to fragments in its descent.
Ch 4: Then something resembling a little grey snake, about the thickness of a walking stick, coiled up out of the writhing middle, and wriggled in the air towards me- and then another.
Ch 5: It was sweeping round swiftly and steadily, this flaming death, this invisible, inevitable, sword of heat.
Book 2 Ch 2: For a time, however, the red weed grew with astonishing vigour and luxuriance.
Book 2 Cha 4: I was fierce with fear.
Book 2 Ch 8: But there are no bacteria on Mars, and directly these invaders arrived, directly they drank and fed, our microscopic allies began to work their overthrow

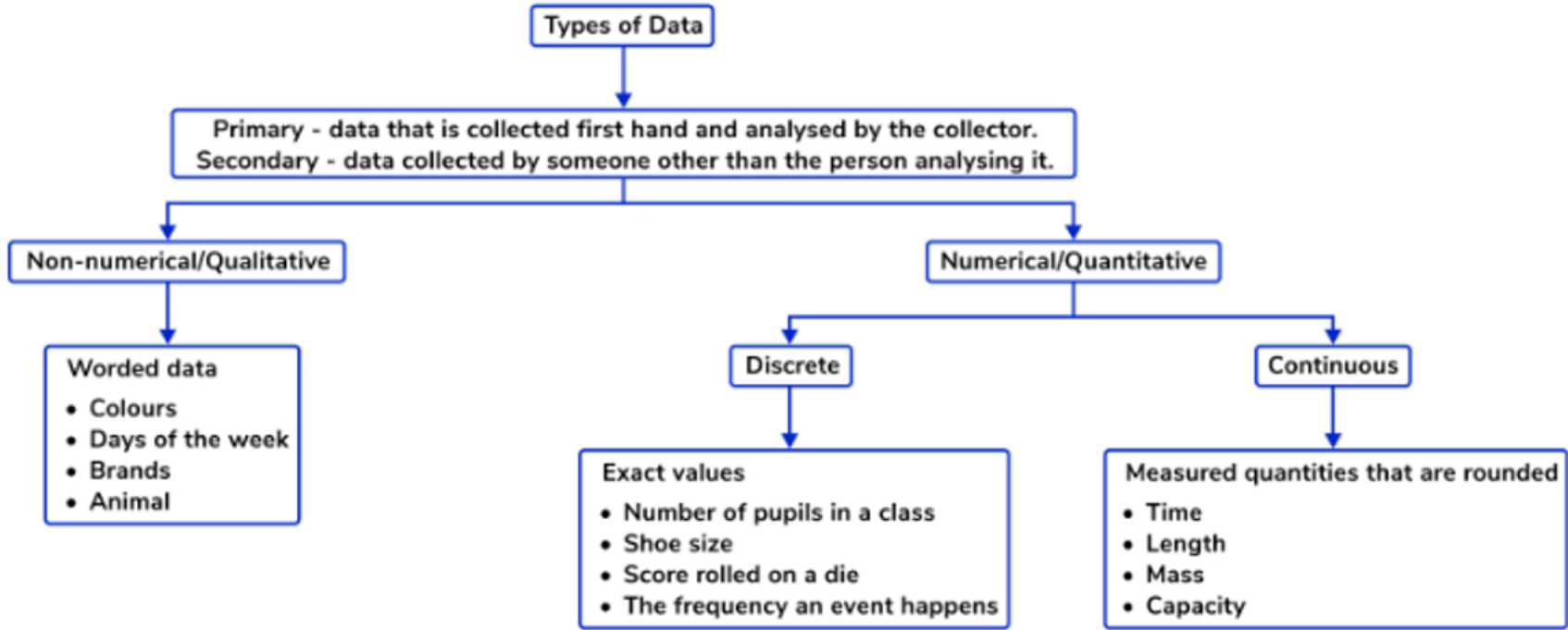


Outlier	<p>A value that 'lies outside' most of the other values in a set of data. An outlier is much smaller or much larger than the other values in a set of data.</p>	
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Sources of secondary data include websites, newspapers, research article, census etc

AVERAGE	PROS	CONS
Mean	Includes every value in the calculation	Affected by 'extreme' values
Median	Isn't affected by 'extreme' values	Doesn't include all the data
Mode	Isn't affected by 'extreme' values Only average that can be used with words	No use if all the data is different

	Advantages	Disadvantages
Primary data	Collection method known Accuracy is known Can find answers to very specific questions	Time-consuming to collect Expensive to collect
Secondary data	Easy to obtain Cheap to obtain Data from some organisations (such as the Office for National Statistics in the UK) can be more reliable than data you collect yourself	Method of collection unknown Data might be out of date May contain mistakes May come from an unreliable source May be difficult to find answers to specific questions

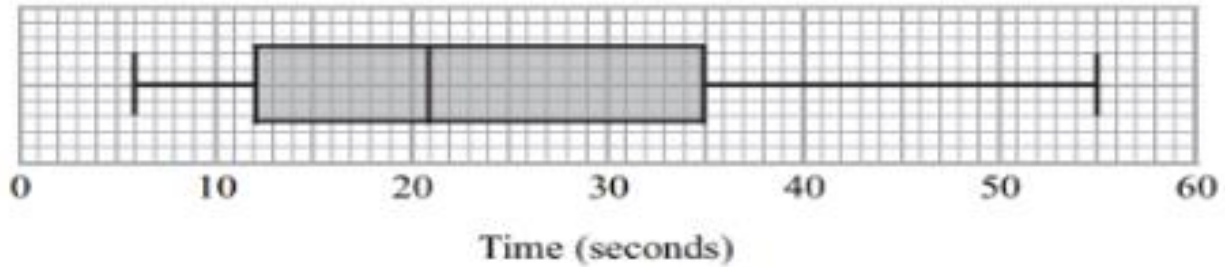


Averages from Frequency Tables

What is the mode? <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Number of cars</th> <th style="width: 50%;">Frequency</th> </tr> </thead> <tbody> <tr><td>0</td><td>2</td></tr> <tr><td>1</td><td>5</td></tr> <tr><td>2</td><td>3</td></tr> </tbody> </table>	Number of cars	Frequency	0	2	1	5	2	3	The mode is 1 car because it has the highest frequency.															
Number of cars	Frequency																							
0	2																							
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What is the range? <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Number of cars</th> <th style="width: 50%;">Frequency</th> </tr> </thead> <tbody> <tr><td>0</td><td>2</td></tr> <tr><td>1</td><td>5</td></tr> <tr><td>2</td><td>3</td></tr> </tbody> </table>	Number of cars	Frequency	0	2	1	5	2	3	Highest number of cars = 2 Lowest number of cars = 0 $2 - 0$ Range = 2															
Number of cars	Frequency																							
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What is the median from a table? <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Number of cars</th> <th style="width: 50%;">Frequency</th> </tr> </thead> <tbody> <tr><td>0</td><td>2</td></tr> <tr><td>1</td><td>5</td></tr> <tr><td>2</td><td>3</td></tr> </tbody> </table>	Number of cars	Frequency	0	2	1	5	2	3	List the values: 0, 0, 1, 1, 1, 1, 1, 2, 2, 2 1 is in the middle 1 is the median															
Number of cars	Frequency																							
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1	5																							
2	3																							
What if the frequencies are large? How do I find the median?	Find the total frequency Locate the median using $\frac{n+1}{2}$ Select this number of cars																							
How do you find the mean from a table? <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Number of cars</th> <th style="width: 50%;">Frequency</th> </tr> </thead> <tbody> <tr><td>0</td><td>2</td></tr> <tr><td>1</td><td>5</td></tr> <tr><td>2</td><td>3</td></tr> </tbody> </table>	Number of cars	Frequency	0	2	1	5	2	3	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Number of cars</th> <th style="width: 33%;">Frequency</th> <th style="width: 33%;">N × F</th> </tr> </thead> <tbody> <tr><td>0</td><td>2</td><td>0 × 2 = 2</td></tr> <tr><td>1</td><td>5</td><td>1 × 5 = 5</td></tr> <tr><td>2</td><td>3</td><td>2 × 3 = 6</td></tr> <tr><td>Total</td><td>10</td><td>13</td></tr> </tbody> </table> $\frac{\text{Total } N \times F}{\text{total frequency}}$ $\text{Mean} = \frac{13}{10} = 1.3$	Number of cars	Frequency	N × F	0	2	0 × 2 = 2	1	5	1 × 5 = 5	2	3	2 × 3 = 6	Total	10	13
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A range of measurements like $25 \leq h < 30$ is called a _____.	Class interval																								
The modal class interval is <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Height, h (cm)</th> <th style="width: 50%;">Frequency</th> </tr> </thead> <tbody> <tr><td>$0 \leq h < 10$</td><td>2</td></tr> <tr><td>$10 \leq h < 20$</td><td>3</td></tr> <tr><td>$20 \leq h < 30$</td><td>8</td></tr> </tbody> </table>	Height, h (cm)	Frequency	$0 \leq h < 10$	2	$10 \leq h < 20$	3	$20 \leq h < 30$	8	$20 \leq h < 30$ is the modal class interval as it has the highest frequency																
Height, h (cm)	Frequency																								
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The class interval containing the median is <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Height, h (cm)</th> <th style="width: 50%;">Frequency</th> </tr> </thead> <tbody> <tr><td>$0 \leq h < 10$</td><td>2</td></tr> <tr><td>$10 \leq h < 20$</td><td>3</td></tr> <tr><td>$20 \leq h < 30$</td><td>8</td></tr> </tbody> </table>	Height, h (cm)	Frequency	$0 \leq h < 10$	2	$10 \leq h < 20$	3	$20 \leq h < 30$	8	Position of median = $\frac{n+1}{2} = \frac{13+1}{2} = 7th$ 2 heights lie in $0 \leq h < 10$ 3 heights lie in $10 \leq h < 20$ (total of 5 heights) <p style="text-align: center;"><i>The 7th height lies in $20 \leq h < 30$</i></p>																
Height, h (cm)	Frequency																								
$0 \leq h < 10$	2																								
$10 \leq h < 20$	3																								
$20 \leq h < 30$	8																								
To calculate an estimate for the mean from a grouped table	Find the midpoints Multiply frequency by midpoint (F × M) $\frac{\text{Total } F \times M}{\text{Total } F}$																								
Calculate estimate for the mean <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Height, h (cm)</th> <th style="width: 50%;">Freq</th> </tr> </thead> <tbody> <tr><td>$0 \leq h < 10$</td><td>2</td></tr> <tr><td>$10 \leq h < 20$</td><td>3</td></tr> <tr><td>$20 \leq h < 30$</td><td>8</td></tr> </tbody> </table>	Height, h (cm)	Freq	$0 \leq h < 10$	2	$10 \leq h < 20$	3	$20 \leq h < 30$	8	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Height, h (cm)</th> <th style="width: 12.5%;">Freq</th> <th style="width: 12.5%;">Midpoint M</th> <th style="width: 50%;">F × M</th> </tr> </thead> <tbody> <tr><td>$0 \leq h < 10$</td><td>2</td><td>5</td><td>10</td></tr> <tr><td>$10 \leq h < 20$</td><td>3</td><td>15</td><td>45</td></tr> <tr><td>$20 \leq h < 30$</td><td>8</td><td>25</td><td>200</td></tr> </tbody> </table> $\frac{\text{Total } F \times M}{\text{Total } F} = \frac{255}{13} = 19.6$	Height, h (cm)	Freq	Midpoint M	F × M	$0 \leq h < 10$	2	5	10	$10 \leq h < 20$	3	15	45	$20 \leq h < 30$	8	25	200
Height, h (cm)	Freq																								
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$20 \leq h < 30$	8	25	200																						
The mean from grouped data is only estimated because....	Midpoints are used																								

Box Plots



The 5 pieces of data you need to plot a box plot are:	Largest, smallest, upper quartile, lower quartile, median
How do you find the position of the median?	$\frac{n+1}{2}$ where n is the number of pieces of data
If there are 15 pieces of data, the position of the median will be...	$\frac{15+1}{2} = 8th\ position$
How do you find the position of the lower quartile?	$\frac{n+1}{4}$ where n is the number of pieces of data
If there are 15 pieces of data, the position of the lower quartile will be	$\frac{15+1}{4} = 4th\ position$
How do you find the position of the upper quartile?	$\frac{n+1}{4} \times 3$ where n is the number of pieces of data
If there are 15 pieces of data, the position of the upper quartile will be	$\frac{15+1}{4} \times 3 = 12th\ position$
To find the interquartile range you...	Upper quartile – lower quartile


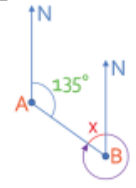
Identify the median	21
Find the interquartile range	UQ = 35 LQ = 12 IQR = 35 – 12 = 23
Work out the range	Largest value = 55 Lowest value = 16 Range = 55 – 16 = 39
If there were 80 times in the data set, how many were 12 or less?	Lower quartile = 12 (25%) 25% of 80 = 20
When comparing two distributions using box plots you must mention which 2 things?	1. The median shows... 2. The interquartile range/ range shows... (mention spread/consistency)
<p>These 2 box plots compare the test results out of 30 in two classes.</p> <p>What would you write to compare the two distributions...</p>	<ol style="list-style-type: none"> The median shows that on average class 1 had a higher score The interquartile range shows that class B had a wider spread
Which class is more consistent above?	The interquartile range shows that class 1 is more consistent


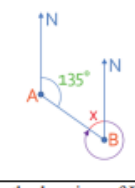
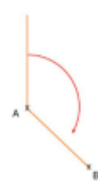

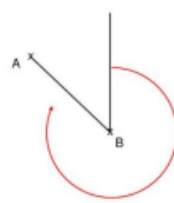

Angles and Parallel lines

<p>Calculate angle y and give the correct reason</p>	<p style="text-align: center;">$y = 126^\circ$</p> <p style="text-align: center;">Reason: alternate angles in parallel lines are equal</p>
<p>Calculate angle z and give the correct reason</p>	<p style="text-align: center;">$z = 126^\circ$</p> <p style="text-align: center;">Reason: corresponding angles in parallel lines are equal</p>
<p>Calculate angle x and give the correct reason</p>	<p style="text-align: center;">$x = 54^\circ$</p> <p style="text-align: center;">Reason: co-interior angles in parallel lines sum to 180°</p>
<p>Calculate angle x and give a reason for your answer</p>	<p style="text-align: center;">$x = 119^\circ$</p> <p style="text-align: center;">Reason: corresponding angles in parallel lines are equal</p>

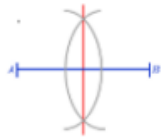
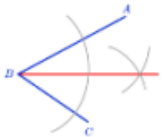

<p>Calculate angle y and give a reason for your answer</p>	<p style="text-align: center;">$x = 61^\circ$</p> <p style="text-align: center;">Reason: angles on a straight line sum to 180°</p>						
<p>Calculate angle z and give a reason for your answer</p>	<p style="text-align: center;">$z = 119^\circ$</p> <p style="text-align: center;">Reason: vertically opposite angles are equal</p>						
<p>Opposite angles in parallelograms are _____</p>	<p style="text-align: center;">equal</p>						
<p>Angles on the same side of parallelograms sum to _____ as they form _____ angles</p>	<p>Angles on the same side of parallelograms sum to 180° as they form co-interior angles</p>						
<p style="text-align: center;"> Angle DCA or $y =$ Angle CDA or $z =$ Angle CAB or $x =$ </p>	<p style="text-align: center;"> Angle DCA or $y = 145^\circ$ Angle CDA or $z = 35^\circ$ Angle CAB or $x = 35^\circ$ </p>						
<p>A good way to set your work out for angle problems where you need to give reasons is...</p>	<p style="text-align: center;">In a table</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Angle</th> <th style="width: 20%;">Value</th> <th style="width: 60%;">Reason</th> </tr> </thead> <tbody> <tr> <td>BAC</td> <td style="text-align: center;">119°</td> <td>Alternate angles in parallel lines are equal</td> </tr> </tbody> </table>	Angle	Value	Reason	BAC	119°	Alternate angles in parallel lines are equal
Angle	Value	Reason					
BAC	119°	Alternate angles in parallel lines are equal					

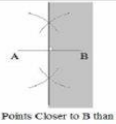
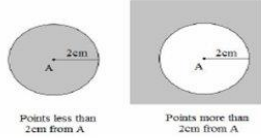
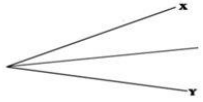

Bearings

Bearings are a measure of	Turn from North
2 key points about bearings are	<ul style="list-style-type: none"> Measured from north clockwise Three digits $72^\circ \rightarrow 072^\circ$
Two north lines joined form _____ angles and sum to _____	Two north lines joined form co-interior angles and sum to 180°
Name the bearings of the compass points	
 <p style="text-align: center;">Angle x =</p>	<p>Angle $x = 180 - 135 = 45^\circ$</p>

<p>The bearing of B from A is ____</p> 	<p>135°</p>
<p>The bearing of A from B is ____</p> 	<p>$360 - 45 = 315^\circ$</p> <p style="text-align: center;">OR</p> <p>$135 + 180 = 315^\circ$</p>
<p>To measure the bearing of B from A you place your protractor like....</p> <p style="text-align: center;">Use the _____ scale</p> <p>Write your answer with ____ digits</p> 	<p style="text-align: center;">Place your protractor like this</p>  <p style="text-align: center;">Use the outside scale</p> <p style="text-align: center;">Write your answer with 3 digits</p>
<p>To measure the bearing of A from B you place your protractor like</p> <p style="text-align: center;">Use the _____ scale</p> <p style="text-align: center;">Subtract from _____</p> 	<p style="text-align: center;">Place your protractor like this</p>  <p style="text-align: center;">Use the inside scale</p> <p style="text-align: center;">Subtract from 360°</p>
<p>If a journey occurs on a certain bearing, to find the return journey's bearings you</p>	<p>Add 180</p>

Constructions and Loci

Perpendicular means	Forms a right angle
Bisect means	Cut in half
Sketch the construction lines for the perpendicular bisector of a line	
Sketch the construction lines to bisect an angle	 <p style="text-align: center;">Angle bisector</p>
Sketch the construction lines for a perpendicular bisector to point	
Equidistant means	The same (equal) distance

Loci and Regions	<p>A locus is a path of points that follow a rule.</p> <p>For the locus of points closer to B than A, create a perpendicular bisector between A and B and shade the side closer to B.</p> <p>For the locus of points equidistant from A, use a compass to draw a circle, centre A.</p> <p>For the locus of points equidistant to line X and line Y, create an angle bisector.</p> <p>For the locus of points a set distance from a line, create two semi-circles at either end joined by two parallel lines.</p>	 <p style="font-size: small;">Points Closer to B than A</p>  <p style="font-size: small;">Points less than 2cm from A Points more than 2cm from A</p>  
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Substitution and Solving

Substitute means	Replace the number with a letter
Evaluate $5a$ when $a = 2$	$5a$ means $5 \times a$ $5 \times 2 = 10$
Evaluate $\frac{a}{3}$ when $a = 12$	$\frac{a}{3}$ means $a \div 3$ $12 \div 3 = 4$
If $a = 3$ and $b = 5$ Evaluate $10ab$	$10 \times 3 \times 5 = 150$
If $a = 3$ and $b = 5$ Evaluate $4a - 2b$	$4a = 4 \times 3 = 12$ $2b = 2 \times 5 = 10$ $12 - 10$
If $b = 5$ Evaluate $3b^2$	Squaring comes first $5^2 = 25$ $25 \times 3 = 75$
The cost C of hiring a boat for h hours with an initial payment is given by the formula $C = 10 + 3h$ What is the cost of the initial payment?	$\pounds 10$
The cost C of hiring a boat for h hours is given by the formula $C = 10 + 3h$ What is the hourly cost?	$\pounds 3.00$ an hour
The cost C of hiring a boat for h hours is given by the formula $C = 10 + 3h$	$h = 4$ $10 + 3 \times 4 =$ (multiply first)
What is the cost of hiring a boat for 4 hours?	$= 10 + 12 = \pounds 22.00$

Solve means	Find the value of the unknown
Solve $y + 3 = 9$	$y + 3 = 9$ $-3 \quad -3$ $y = 6$
Solve $y - 3 = 9$	$y - 3 = 9$ $+3 \quad +3$ $y = 12$
Solve $3y = 9$	$3y$ means $3 \times y$ $3y = 9$ $\frac{3y}{3} = \frac{9}{3}$ (9 divided by 3) $y = 3$
Solve $\frac{y}{3} = 9$	$\frac{y}{3}$ mean y divided by 3 $\frac{y}{3} = 9$ $\times 3 \quad \times 3$ $y = 27$
Which inverse operation would you carry out to both sides first? Solve $2x + 9 = 20$	Subtract 9 from both sides $Leaving 2x = 11$
Which inverse operation would you carry out to both sides first? Solve $2x - 9 = 20$	Add 9 to both sides $Leaving 2x = 29$
Which inverse operation would you carry out to both sides first? Solve $20 = \frac{x}{2} - 9$	Add 9 to both sides leaving $20 = \frac{x}{2}$
Which inverse operation would you carry out to both sides first? Solve $20 = \frac{x-9}{2}$	The $x - 9$ is grouped ($x - 9$) Dividing by two needs eliminating first by $\times 2$ $Solve 20 = \frac{x-9}{2}$ $\times 2 \quad \times 2$ $Leaving 40 = x - 9$
If there are unknowns on both sides...	Eliminate the smallest unknown using inverse operations
What would you eliminate first and how? Solve $3x + 10 = x + 16$	Remove the x from both sides by $-x$ $Solve 3x + 10 = x + 16$ $-x \quad -x$ $Leaving 2x + 10 = 16$
What would you eliminate first and how? Solve $3x + 10 = 16 - x$	Remove the $-x$ from both sides by $+x$ $Solve 3x + 10 = 16 - x$ $+x \quad +x$ $Leaving 4x + 10 = 16$
Equations with brackets Solve $3(x - 4) = 18$	Expand the bracket Solve by eliminating and balancing $3x - 12 = 18$ $+12 \quad +12$ $3x = 30$ $x = 10$

Solving Simultaneous Equations (by Elimination)	<ol style="list-style-type: none"> 1. Balance the coefficients of one of the variables. 2. Eliminate this variable by adding or subtracting the equations (Same Sign Subtract, Different Sign Add) 3. Solve the linear equation you get using the other variable. 4. Substitute the value you found back into one of the previous equations. 5. Solve the equation you get. 6. Check that the two values you get satisfy both of the original equations. 	$5x + 2y = 9$ $10x + 3y = 16$ <p>Multiply the first equation by 2.</p> $10x + 4y = 18$ $10x + 3y = 16$ <p>Same Sign Subtract (+10x on both)</p> $y = 2$ <p>Substitute $y = 2$ in to equation.</p> $5x + 2 \times 2 = 9$ $5x + 4 = 9$ $5x = 5$ $x = 1$ <p>Solution: $x = 1, y = 2$</p>
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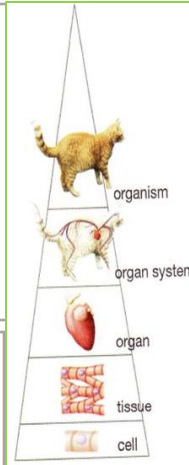
Biology Knowledge Organiser

Cell Biology

Unicellular vs. multicellular organisms

Unicellular organisms' bodies are simply one cell. All bacteria and other prokaryotic organisms are unicellular. **Multicellular** organisms are made of many cells and are much more complex. In multicellular organisms, cells **differentiate** to become **specialised cells**, carrying out specific roles in the organism.

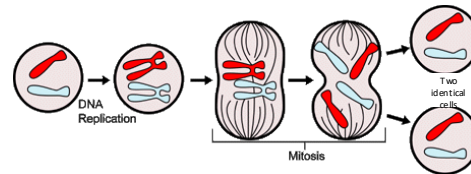
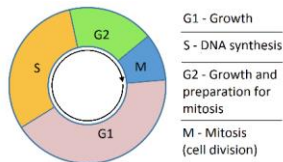
The levels of organisation in multicellular organisms form a **hierarchy**. In biology, hierarchies get simpler as you go down; or more complex as you go up because the upper things are made up of the things below them. The organisational hierarchy in multicellular organisms is shown here.



Stem cells

Once cells are specialised, they can't go back to being an unspecialised cell. This is why we all start life as a mass of unspecialised cells, called **stem cells** – this is what an embryo is. Stem cells can divide to make new cells and can differentiate to become specialised cells.

In a young embryo, all the cells are stem cells, so they can be taken, cloned and used to produce any human cells by differentiation. In adults, there are not many stem cells left – most have differentiated. But there are some, for repair and replacement of specialised cells. For instance, there are stem cells in the bone marrow. These can be collected, cloned and made to differentiate into any type of blood cell. Using stem cells in this way is an active area of medical research, to treat conditions like diabetes and paralysis.



Key Terms	Definitions
unicellular	Describes organisms formed of only one cell: like all prokaryotic organisms
multicellular	Describes organisms made of many cells.
differentiation	The process of becoming a specialised cell. Specialised cells are the result of differentiation of stem cells .
stem cells	Cells that are undifferentiated. Stem cells are capable of forming many more cells of the same type (by cell division), and forming certain types of specialised cell by cell division.
embryo	A very young multicellular organism, formed by fertilisation. Embryos are made of stem cells.
cell cycle	The series of stages during which cells divide to make new cells. In the cell cycle, the DNA is replicated (copied exactly) and the cell splits by mitosis into two cells with one set of DNA each.
mitosis	The specific part of the cell cycle where the cell divides to make two new cells, which are identical.
chromosome	A structure made from one molecule of DNA. One chromosome contains many genes. In body cells, chromosomes are found in pairs (since you inherit one

The cell cycle – diagram bottom left

Cells divide to make new cells, for growth and repair, in the **cell cycle**. It isn't as simple as the cell splitting in two: it must prepare before doing that.

1. The cell grows larger and makes more sub-cellular structures, such as ribosomes and mitochondria. (It makes enough for two cells!)
2. The genetic material (**DNA**) is doubled by making an **exact replica** of the chromosomes. So, there are two copies of every chromosome at this point in the cell cycle.
3. Then, **mitosis** occurs: tiny fibres in the cell pull the copies of each chromosome to opposite ends of the cell, breaking the replica chromosomes apart. This means there are two full sets of chromosomes at each end of the cell.
4. The cytoplasm and cell membranes divide to form two **genetically identical** cells. This is summarised in the diagram immediately to the left.

Biology Knowledge Organiser

B10 - The human nervous system

Homeostasis

Unless chemical and physical conditions in the body are kept within strict limits, cells die. Thus, our bodies constantly and automatically regulate the internal conditions in the body to maintain optimum functions. This regulation is called **homeostasis**. It is vital for proper enzyme functioning, and indeed all cell functions.

Some factors that need controlling by homeostasis in the human body:

- Blood glucose concentration
- Body temperature
- Water levels
- Nitrogen levels.

The regulation that takes place can be carried out by the **nervous system**, the **endocrine system** (which produces hormones), or a combination of the two. These automatic control systems we use for homeostasis all include:

- **Receptor cells** – these detect changes in the environment. Changes are called **stimuli**.
- **Coordination centres** – these receive information from receptor cells (electrical or chemical information) and process the information. Examples include the brain, spinal cord and pancreas.
- **Effectors** – these are muscles or glands, which carry out the responses as directed by the control centre. **Muscles contract** and **glands** release **chemicals**, such as hormones.

The human nervous system

The nervous system is a network of neurones (nerve cells), bundled into nerves. It includes the nerves all over the body and the **central nervous system**, which consists of the **brain** and **spinal cord**. The nervous system allows us to react to the surroundings and control our behaviour. It can act involuntarily (in **reflexes**) or voluntarily.

Information from receptors, in the form of electrical impulses, passes along neurones to the central nervous system (CNS for short); the CNS coordinates the response by transmitting electrical impulses to the effectors (see above).

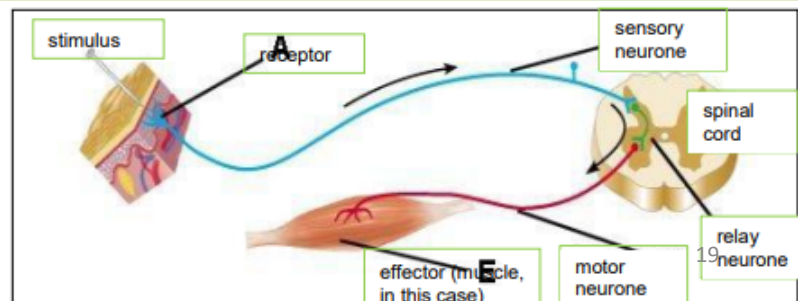
A reflex arc causes reflex actions, which are rapid and automatic (automatic because they don't involve the conscious part of the brain).

Key Terms	Definitions
Homeostasis	Regulating the internal conditions of the body in response to internal or external changes, to maintain optimum conditions for the body's functioning
Endocrine system	The network of hormone-producing glands in the body. Hormones are chemical messengers that travel in the bloodstream to their target tissues.
Blood glucose	Glucose (a simple sugar) is transported in the blood, as all cells require it for respiration. The concentration of blood glucose must be kept within very tight limits at all times.
Stimulus	A change in the environment, detected by a receptor cell. E.g. light, sound, chemicals (smells and tastes), pressure, pain, temperature etc.
Nerve	A nerve is just a collection of many nerve cells; nerve cells are called neurones . Neurones transmit (carry) information as electrical impulses .

The reflex arc and reflex actions

Reflex actions, for instance pulling your hand away from a pain stimulus, follow a simple pathway.

1. The **receptor** detects the **stimulus** and passes electrical impulses along the **sensory neurone** to the CNS (the spinal cord part, in this case).
2. There is a junction (tiny gap) between the sensory neurone and the **relay neurone** called a **synapse**. Here, a chemical is released that diffuses across the gap and causes an electrical impulse to pass along the relay neurone.
3. There is another synapse between the relay neurone and the **motor neurone**, again a chemical is released that causes the electrical impulse to pass along the motor neurone.
4. The impulse arrives at the **effector** – in this example, a muscle that contracts to pull your hand away from the source of pain.



Biology Knowledge Organiser

B15 - Genetics and evolution

Classification the traditional way

People have always given living organisms names and attempted to group them together based on their similarities. The first system that has stuck around is the classification system described by Carl Linnaeus, in which he sorted organisms according to their **structure** (anatomy) and **characteristics**. He came up with a **hierarchical** system, where the larger groups contain all the smaller groups below them. It is called the Linnaean system, after him.

These groups, in order of size (based on how many organisms fit in each one) are called: **kingdom, phylum, class, order, family, genus** and **species**. Species are what you think of as individual types of organism – like tigers, oak trees or great white sharks. It is worth remembering that some organisms that are given one name in everyday language actually represent many species. For instance, there are many species of eagle and many species of shark.

When giving the scientific name of an organism, you give the genus and species. E.g. great white sharks are *Carcharodon carcharias*, humans are *Homo sapiens*. This is called the **binomial system** for naming species.

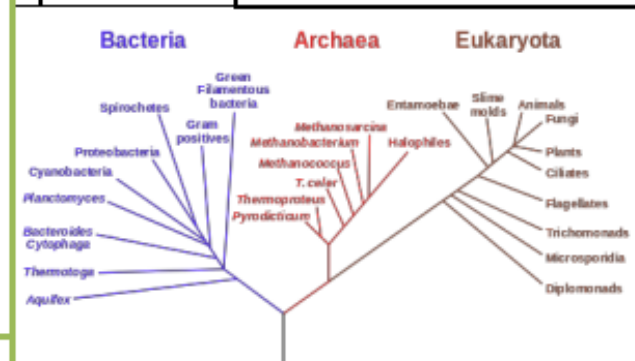
Classification the modern way

The Linnaean system dates back to the 18th century. Since then, knowledge and understanding of the internal structure of cells and biochemistry has developed significantly. Analysis of genetic material in cells has shown that the five kingdoms suggested by Linnaeus are not the best way to divide up life. A **three-domain system** is now used (although the Linnaean system is still very useful, and commonly used). The three-domain system was suggested by Carl Woese.

Woese's chemical analysis showed that there are three distinct groups of life, into which all organisms can fit without overlapping. These are called domains: the Archaea, Bacteria, and Eukaryota. One of the key things about this system is that is recognised that two huge groups of organisms (archaea and bacteria) are actually different. In the Linnaean system, they were bunched together in the 'bacteria' kingdom.

Since it is based on genetic analysis, the three-domain system links to the closeness of the relationship between organisms. We know all life on Earth is related (since we all use the same genetic code). That's why, when you draw an evolutionary tree (right), it starts with one 'trunk' – the first life on Earth (the **common ancestor** for us all). But, clearly, life has split into many different groups, as shown with the examples on the tree here.

Key Terms	Definitions
Classification	Sorting into groups. Traditional classification of organisms depends on their structure, but more modern methods involve analysing the biochemical similarities between organisms to classify them.
Kingdom	The largest group in the Linnaean system. In this model, there are five kingdoms (animals, plants, fungi, bacteria and protists).
Biochemistry	The study of chemicals in living organisms, such as DNA, proteins, carbohydrates and lipids.
Three-domain system	A modern model of classification, based on the genetic differences between organisms.
Archaea	Unicellular, like bacteria, but biochemically very different. These organisms often live in extreme environments, like very hot water around geysers. No-one realised that they were fundamentally different to bacteria before the chemical analysis was performed.
Bacteria	Also called 'true bacteria' – the prokaryotic organisms you think of as bacteria. (Check your knowledge on prokaryotic cells)
Eukaryota	All organisms with a nucleus, like us, plants, fungi and protists. All multicellular organisms fit into this domain (but it does include many unicellular organisms!).
Evolutionary tree	A method used to show how closely related organisms are. For living organisms, we can use genetic analysis; for extinct organisms, the fossil record suggest the relationships.



Biology Knowledge Organiser

B15 - Genetics and evolution

Evidence for evolution

There is a vast haul of evidence to support Darwin's theory of evolution by natural selection. This evidence has built up over time: for example, Darwin didn't know about genes so found it hard to explain inheritance from parents in full. Obviously, we've got this knowledge now.

Thanks to all this evidence, Darwin's theory for evolution is now very widely accepted. Two key bodies of evidence for you to know are: the fossil record, and the evolution of resistant bacteria.

Fossils

Fossils are the remains of organisms. They are always old, typically millions of years old, and are found in rocks. They can form by:

1. The organism or parts of the organism don't **decay** because the conditions are not right for decay by microorganisms. For example, mammoths have been preserved in frozen mud.
2. Parts of the organism are replaced by **minerals** from the surrounding rocks as they decay. Most often, this results in soft tissues (e.g. muscle, skin) *decaying* normally, but the form of bones is preserved by the minerals in bones being swapped for minerals from the *rocks/sediments* that the dead organisms were buried under.
3. Preserved **traces** of organisms – so not their actual bodies, but traces like footprints, droppings, burrows and the traces of roots.

As most fossils are formed from bones, and many early forms of life had **soft bodies** (no bones), there are few traces of early forms of life. Any traces there were tend to have been destroyed by geological activity (movements of tectonic plates, volcanic activity and so on). This means the fossil record is **incomplete** and scientists cannot be totally sure about the origin of life on Earth.

The fossil record helps scientists fill in timelines and **evolutionary trees** to show how life has changed over time on Earth. Using evolutionary trees shows the closeness of relationships between different species.

Extinction

Extinctions of a species can happen for many reasons, and often extinction is due to more than one factor working together. Some key factors that may contribute to extinction of a species:

- Development of **new** species, so the old species doesn't exist anymore
- **New** diseases affecting a species, which they aren't adapted to and can't survive
- **New** predators, to which a species cannot adapt fast enough to survive
- **Changes** to the environment, to which the species cannot adapt by natural selection, including **catastrophic** events (like the meteor strike that caused extinction of loads of species, e.g. dinosaurs)
- **New** competitors that are better adapted to the environment than the species.

Key Terms	Definitions
Fossil	The remains of organisms from millions of years ago, found in rocks. They are formed in different ways – see main text.
Strain	A variant of microorganism within a species – so they are not a different species to other variants, but have a key difference in their phenotype (e.g. being resistant to an antibiotic). New strains are produced by mutations .
Resistant strain	Describes a variant form of bacteria with resistance (NOT immunity) to a specific antibiotic.
MRSA	An example of a resistant strain of bacteria. It stands for methicillin resistant <i>Staphylococcus aureus</i> .
Extinction	When NO individuals of a species remain alive.
Evolutionary tree	A timeline that shows how closely related different species are to each other.

Resistant bacteria

The key factor that affects the **rate** of evolution is how fast an organism reproduces. Bacteria can reproduce as fast as doubling every 20 minutes, so they can evolve rapidly.

Thanks to a **mutation**, strains of bacteria that are **resistant** to an antibiotic can emerge. These are NOT killed by antibiotics used to try to kill them when the bacteria has infected someone. Consequently, they **survive** and **reproduce**, so the size of the resistant strain population increases generation to generation, while the non-resistant strain is wiped out. Furthermore, the resistant strain is likely to spread because if it infects other people and:

- They are not immune to it
- And there is no effective treatment.

Society benefits if we **reduce** the rate of development of antibiotic resistant strains of bacteria. Some methods to help save the day:

- Antibiotics should not be **prescribed** by doctors where they are not needed (especially for viral infections, since antibiotics don't work on viruses).
- Patients need to **finish the full course** of antibiotics they get prescribed, reducing the chance of any surviving and mutating to form resistant strains.
- **Restrict** the use of antibiotics in **agriculture**, as at present many animals receive antibiotics all the time to prevent infections and encourage growth.

We also badly need new antibiotics. However, it is slow and expensive to develop new antibiotic drugs, and at the moment we are not keeping up with the emergence of resistant strains of bacteria.

Year 9 Forces and Motion

1 Scalar and vectors

A scalar quantity has **magnitude** only. Examples include temperature or mass.

A vector quantity has both **magnitude** and **direction**. Examples include velocity.

Speed is the scalar magnitude of velocity.

A vector quantity can be shown using an **arrow**. The size of the arrow is relative to the magnitude of the quantity and the direction shows the associated direction.

2 Contact and non-contact forces

Forces either **push** or **pull** on an object. This is as a result of its interaction with another object.

Forces are categorised into two groups:

Contact forces – the objects are touching e.g. friction, air resistance, tension and contact force.

Non-contact forces – the objects are not touching e.g. gravitational, electrostatic and magnetic forces.

Forces are calculated by the equation: $\text{force (N)} = \text{mass (kg)} \times \text{acceleration (m/s}^2\text{)}$

Forces are another example of a **vector quantity** and so they can also be represented by an **arrow**.



3 Gravity

Gravity is the natural phenomenon by which any object with mass or energy is drawn together.

- The **mass** of an object is a scalar measure of how much matter the object is made up of. Mass is measured in **kilograms (kg)**.
- The **weight** of an object is a vector measure of how gravity is acting on the mass. Weight is measured in **newtons (N)**.

$$\text{weight (N)} = \text{mass (kg)} \times \text{gravitational field strength (N/kg)}$$

(The gravitational field strength will be given for any calculations. On earth, it is approximately 9.8N/kg).

An object's **centre of mass** is the point at which the weight of the object is considered to be acting. It does not necessarily occur at the centre of the object.

The mass of an object and its weight are **directly proportional**. As the mass is increased, so is the weight. Weight is measured using a **spring-balance (or newton metre)** and is measured in **newtons (N)**.

4 Resultant force

A **resultant force** is a single force which replaces several other forces. It has the same effect acting on the object as the combination of the other forces it has replaced.

The forces acting on this object are represented in a **free body diagram**. The arrows are relative to the magnitude and direction of the force.

The car is being pushed to the left by a force of 30N. It is also being pushed to the right by a force of 50N.



The resultant force is $50\text{N} - 30\text{N} = 20\text{N}$

The 20N resultant force is pushing to the right, so the car will move right.

When a resultant force is not zero, an object will **change speed (accelerate or decelerate)** or **change direction (or both)**.

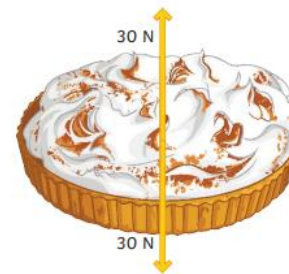
When an object is stationary, there are still forces acting upon it.

In this case, the resultant force is $30\text{N} - 30\text{N} = 0\text{N}$.

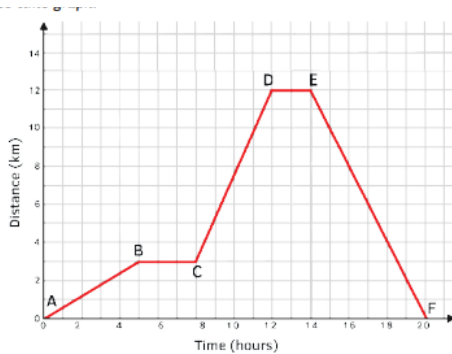
The forces are in **equilibrium** and are **balanced**.

When forces are balanced, an object will either **remain stationary** or if it is moving, it will continue to move at a **constant speed**.

When resultant forces act along the same line, you calculate the resultant force as shown below.



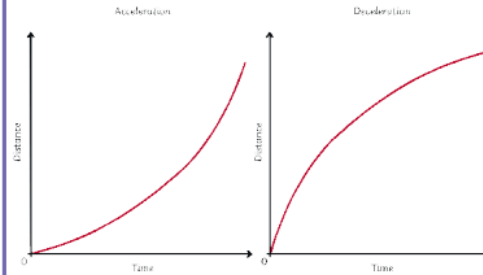
1 Distance-time and Velocity-time Graphs



You should be able to understand what the features of the two types of graph can tell you about the motion of an object.

Graph Feature	Distance-Time Graph	Velocity-Time Graph
x-axis	time	time
y-axis	distance	velocity
gradient	speed	acceleration (or deceleration)
plateau	stationary (stopped)	constant speed
uphill straight line	steady speed moving away from start point	acceleration
downhill straight line	steady speed returning to the start point	deceleration
uphill curve	acceleration	increasing acceleration
downhill curve	deceleration	increasing deceleration
area below graph		distance travelled

2 change speed on a D-T graph



When the graph is a **straight line**, it is representing a **constant speed**. A **curve** represents a changing speed, either **acceleration** or **deceleration**. The speed at any given point can be calculated by drawing a **tangent** from the curve and finding the **gradient** of the tangent.

3 Terminal Velocity

When an object begins moving, the force **accelerating** the object is much greater than the force resisting the movement. A resistant force might be **air resistance** or **friction**, for example.

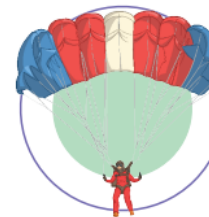
As the **velocity** of the object increases, the force **resisting** the movement also increases. This causes the acceleration of the object to be reduced gradually until the forces become **equal** and are **balanced**. This doesn't cause the object to stop moving. As the object is already in motion, balanced forces mean it will continue to move at a **steady speed**. This steady speed is the maximum that the object can achieve and is called the **terminal velocity**.

The terminal velocity of an object depends on its shape and weight. The shape of the object determines the amount of resistant force which can act on it. For example, an object with a large surface area will have a greater amount of resistance acting on it.

Consider a skydiver and his parachute. When the skydiver first jumps from the aeroplane, he has a small area where the air resistance can act. He will fall until he reaches a terminal velocity of approximately 120mph.



After the skydiver releases his parachute, the shape and area has been changed and so the amount of air resistance acting is increased. This causes him to decelerate and his terminal velocity is reduced to about 15mph. This makes it a much safer speed to land on the ground.



4 Momentum

$$\text{momentum (N)} = \text{mass (kg)} \times \text{velocity (m/s)}$$

The law of conservation of mass (in a closed system) states that the total momentum **before** an event is equal to the total momentum **after** an event.

Worked example:

Calculate the momentum of a 85kg cyclist travelling at 7m/s.

$$p = m \times v$$

$$p = 85\text{kg} \times 7\text{m/s}$$

$$p = 595\text{kg m/s}$$

Year 9 Forces and Motion

1 Acceleration

Acceleration can be calculated using the equation:

$$\text{acceleration (m/s}^2\text{)} = \frac{\text{change in velocity (m/s)}}{\text{time taken (s)}}$$

Worked example:

A dog is sitting, waiting for a stick to be thrown. After the stick is thrown, the dog is running at a speed of 4m/s. It has taken the dog 16s to reach this velocity. Calculate the acceleration of the dog.

$$a = \Delta v \div t$$

$$a = (4-0) \div 16$$

$$A = 0.25\text{m/s}^2$$

Changes in velocity due to acceleration can be calculated using the equation below. This equation of motion can be applied to any moving object which is travelling in a straight line with a uniform acceleration.

$$\text{Final velocity}^2 \text{ (m/s)} - \text{initial velocity}^2 \text{ (m/s)} = 2 \times \text{acceleration (m/s}^2\text{)} \times \text{displacement (m)}$$

or

$$v^2 - u^2 = 2as$$

Worked example:

A bus has an initial velocity of 2m/s and accelerates at 1.5m/s² over a distance of 50m. Calculate the final velocity of the bus.

Step 1: rearrange the equation: $v^2 - u^2 = 2as$

$$v^2 = 2as + u^2$$

$$v^2 = (2 \times 1.5 \times 50) + 2^2$$

$$v^2 = (150) + 4$$

$$v^2 = 154$$

$$v = \sqrt{154}$$

$$v = 12.41\text{m/s}$$

3 Braking Distance

The **braking distance** is the distance travelled by a vehicle once the brakes are applied and until it reaches a full stop.

Braking distance is affected by:

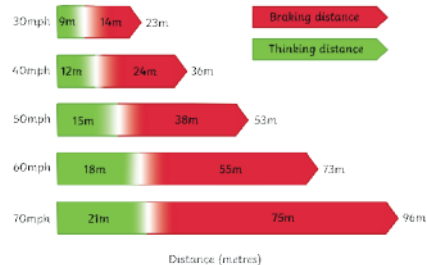
- adverse weather conditions (wet or icy)
- poor vehicle condition (brakes or tyres)

When force is applied to the brakes, **work is done** by the friction between the car wheels and the brakes.

The work done reduces the kinetic energy and it is transferred as **heat energy**, increasing the **temperature** of the brakes.

increased speed = increased force required to stop the vehicle
increased braking force = increased deceleration

Large decelerations can cause a huge increase in **temperature** and may lead to the **brakes overheating** and the driver **losing control** over the vehicle



2 Newton's first law

If the resultant force acting on an object is zero...

- a stationary object will remain stationary.
- a moving object will continue at a steady speed and in the same direction.

100N resistance (friction and air) 100N



Inertia – the tendency of an object to continue in a state of rest or uniform motion (same speed and direction).

4 Newton's Second Law

The acceleration of an object is proportional to the resultant force acting on it and inversely proportional to the mass of the object

$$\text{resultant force (N)} = \text{mass (kg)} \times \text{acceleration (m/s}^2\text{)}$$

Inertial mass – how difficult it is to change an objects velocity. It is defined as the ratio of force over acceleration.

5 Newtons Third Law

When two objects interact, the forces acting on one another are always equal and opposite.

For example, when a book is laid on the table, it experiences a reaction force from the table. The table pushes up on the book. The book also pushes down on the table. These two forces are equal and opposite.

6 Stopping distance

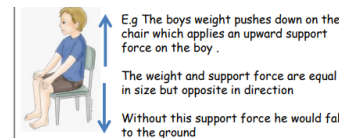
The **stopping distance** of a vehicle is calculated by:
stopping distance = thinking distance + braking distance

Reaction time is the time taken for the driver to respond to a hazard. It varies from 0.2s to 0.9s between most people.

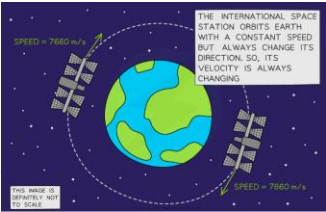
Reaction time is affected by:

- tiredness
- drugs
- alcohol
- distractions

You can measure human reaction time in the lab using simple equipment: a metre ruler and stopwatch can be used to see how quickly a person reacts and catches the metre ruler. The data collected is quantitative and you should collect repeat readings and calculate an average result.

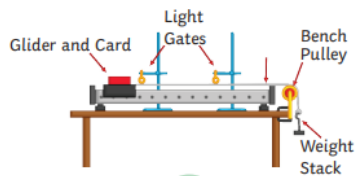


Year 9 Forces and Motion

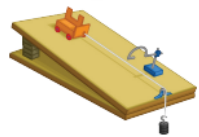


1) Investigating the effect of varying the force on a constant mass and the effect of varying the mass of an object on the acceleration produced by a constant force. $F=ma$

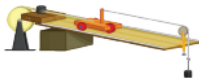
You may be given any of the following apparatus set-ups to conduct these investigations:



or



or



Something is a fair test when only the independent variable has been allowed to affect the dependent variable.

The independent variable was force.

The dependent variable was acceleration.

The control variables were:

- same total mass
- same surface/glider/string/pulley (friction)
- same gradient if you used a ramp

2 Circular Motion

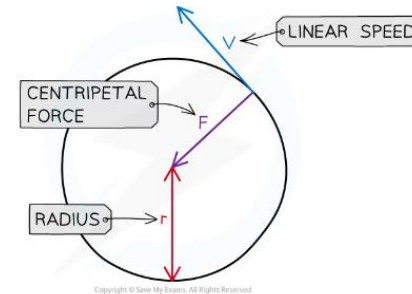
- Velocity is a **vector** quantity, and the velocity of an object is its **speed** in a given **direction**
- When an object travels along a circular path, its velocity is always changing
 - The **speed** of the object moving in a circle might be constant - that is, it is travelling the same distance every second
 - However, the **direction** of travel is always changing as the object moves along the circular path
- This means that an object moving in circular motion travels at a **constant speed** but has a **changing velocity**

3 Centripetal Force

- An object moving in a circle is not in equilibrium as it has a resultant force acting upon it
 - This is known as the **centripetal force** and is what keeps the object moving in a circle
- The centripetal force (F) is defined as:

The resultant perpendicular force towards the centre of the circle required to keep a body in uniform circular motion

- The centripetal force is shown by the arrow labelled F in the diagram below:

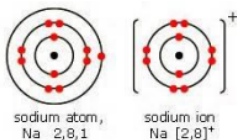


Centripetal force is always perpendicular to the direction of travel and is directed towards the centre of the circle

Year 9 Ionic Bonding

1 Ions

All atoms want to have a full outer shell of electrons, some atoms will lose electrons, these are metals. Some atoms will want to gain electrons, these are **non metals**. An ion is an atom with a positive or negative charge, these are formed by an atom gaining or losing electrons. For example, Sodium has one electron in its outer shell, it therefore loses one electron to form a Na^+ ion. We represent ions with square brackets around the ion and the charge in the top right corner.

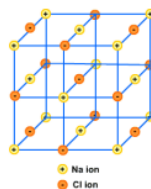


The **group number** indicates how many electrons an atom would have to lose or gain to get a full outer shell of electrons. See below to see what ions different groups form

Group	What happens to the electrons?	Charge on ions
1	Loose 1	+1
2	Loose 2	+2
3	Loose 3	+3
5	Gain 3	-3
6	Gain 2	-2
7	Gain 1	-1

2 Ionic Lattice

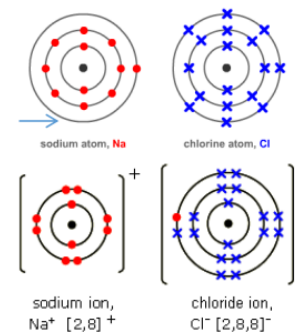
Ionic compounds have **regular structures (giant ionic lattices)** in which there are strong **electrostatic forces** of attraction in all directions between oppositely charged ions.



Key Terms	Definitions
Metal	An element which loses electrons to form positive ions
Non Metal	An element which gains electrons to form negative ions
Ion	An atom with a positive or negative charge, due to loss or gain of electrons
Ionic Bond	A bond formed by the electrostatic attraction of oppositely charged ion
Electrostatic	The force between a positive and negative charge.

3 Ionic Bonding

When a metal atom reacts with a non-metal atom electrons in the outer shell of the **metal atom are transferred to the non metal atom**. This means the metal has a positive charge and the non metal has a negative charge. This means there is an **electrostatic attraction** between the two ions, this is what forms an ionic bond. Both atoms will have a **full outer shell** (this is the same as the structure of a Noble gas) see example below of sodium chloride.



Year 9 Covalent Bonding

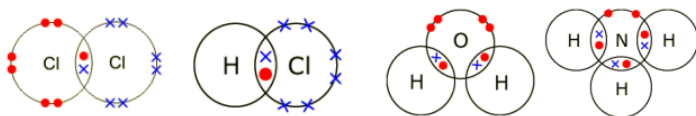
1 Covalent Bonding

Covalent bonding occurs between two non metals, **electrons are shared between the atoms**, so that they have a full outer shell. Covalent bonds are strong and require a lot of energy to break. The simplest example is hydrogen, both hydrogen atoms have **one electron in their outer shell. Therefore both hydrogen atoms share one electron each**, to give them both a full outer shell, we can show this bond on a dot and cross diagram.



When drawing covalent molecules we use "dot cross diagrams" as we do with ionic compounds, it is important to represent the electrons on one atom with a dot and on the other atom with an X.

The first five examples, **hydrogen, chlorine, water, hydrogen chloride and ammonia (NH₃)** all share one electron per atom in a to make a full outer shell of electrons on each atom.



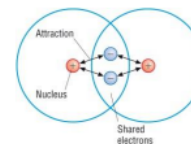
Some atoms need more than one electron to give them a full outer shell, for example oxygen needs 2 electrons to complete its outer shell, oxygen therefore shares two electrons per atom to **make a double bond**. Nitrogen needs three electrons to complete its outer shell, this forms a triple bond between the two **nitrogen atoms, to make a nitrogen molecule**



Key Terms	Definitions
Covalent Bonding	Bonding between 2 atoms where electrons are shared
Molecule	A substance which contains two or more bonded atoms
Lone Pair	A pair of electrons that are not part of the covalent bond

2 The nature of a Covalent Bond

Covalent bonds are strong because there is electrostatic attraction between the electrons in the covalent bond and the positively charged nucleus. This means a lot of energy is required to break a covalent bond.



ACTIVITY VERBS

ir	To go
jugar	To play
comer	To eat
visitar	To visit
hacer	To do
bailar	To dance
beber	To drink
ver	To watch
escuchar	To listen
leer	To read
comprar	To buy
terminar	To finish
escribir	To write
dormir	To sleep
nadar	To swim
quedar	To stay
viajar	To travel
cantar	To sing
mandar SMS	To text
contactar	To contact
llamar	To call
cocinar	To cook
ayudar	To help
trabajar	To work
relajarse	To relax
descansar	To rest

INTENSIFIERS

muy	very	extremadamente	extremely
tan	so	demasiado	too
bastante	quite	realmente	really
un poco	a bit	nada	not at all

HEALTHY LIVING VERBS

acostarse	To go to bed
apetecer	To fancy (feel like)
conseguir (un trabajo)	To get a job
Correr	To run
Drogarse	To take drugs
Emborracharse	To get drunk
Encontrarse bien/mal	To feel well/unwell
Estar a dieta	To be on a diet
Estar en forma	To be in shape
Mantenerse en forma	To stay in shape
Evitar	To avoid
Fumar	To smoke
Intentar (+ infinitive)	To try (to do something)
Levantarse	To get up
Preocuparse	To worry
Sentirse	To feel
Tener dolor	To have pain
Tener sueño	To feel sleepy
Superar	To overcome

GENTE

con
mis amigos
mi hermano
mi hermana
mis padres
mi familia
solo/a

PEOPLE

with
my friends
my brother
my sister
my parents
mi family
alone

SITIOS

En casa	At home
En la casa de <u>mi amigo</u>	At my friend's house
En mi dormitorio	In my bedroom
En el salón	In the living room
En el jardín	In the garden
En mi barrio	In my neighbourhood
En Inglaterra	In England
En el extranjero	Abroad
En el pueblo	In town
En el campo	In the countryside
En las montañas	In the mountains
En la costa	At the coast

PLACES

ADJECTIVES

relajante	relaxing
agradable	pleasant
serio/a	serious
deportivo/a	sporty
enriquecedor/a	enriching
divertido/a	fun
emocionante	exciting
rápido/a	quick
molesto/a	annoying
gratificante	rewarding
aburrido/a	boring
fácil	easy
difícil	difficult
interesante	interesting
bueno/a para la salud	healthy
malo/a para la salud	unhealthy

Verbs and the present tense in Spanish

The infinitive

When you look up a verb in the dictionary, you find its original, unchanged form which is called the **infinitive** (comer, beber, jugar, visitar, vivir, ir etc.). The infinitive ends in **-ar, -er or -ir**.

Forming the present tense in Spanish

Take off the last 2 letters of the infinitive (**-ar, -er or -ir**) and add the following endings depending on the pronoun:

*Important! There are some key irregulars to learn which don't follow this pattern – ir (as shown here), ser, tener and hacer are really important!

	AR verb	ER verb	IR verb
yo (I)	-o	-o	-o
tu (you)	-as	-es	-es
él/ella (he/she)	-a	-e	-e
nosotros/as (we)	-amos	-emos	-imos
vosotros/as (you all)	-áis	-éis	-ís
ellos/ellas (they)	-an	-en	-en

Verbs and the near future tense in Spanish

You can talk about the future by using the **near future** tense.

Use part of the verb IR + a + the infinitive to say what you are **going** to do.

Este tarde **voy a jugar** al tenis. *This evening I am going to play tennis.*

Mañana Paul **va a hacer** un pastel. *Tomorrow Paul is going to make a cake.*

IR (to go)

voy	I am going
vas	You are going
va	He /she/one is going
vamos	We are going
vais	You (lot) are going
Van	They are going

Verbs and the past tense in Spanish

The **preterite** is the past tense used in Spanish to describe a completed action at a specific time in the past (e.g. ayer (yesterday), el año pasado (last year)). For regular we take off **-ar, -er – ir** and add the below endings :

	-AR	-ER / -IR
I	é	í
You (sg)	aste	iste
He/she/it	ó	ió
We	amos	imos
You (pl)	asteis	isteis
They	aron	ieron

Examples:

Tomar = to take
 To form "I took"

~~TOMAR~~ > tom > tomé

Hablar = to speak
 To form "she spoke"

~~HABLAR~~ > habl > habló

1. Expressing FUTURE intentions :

Tengo la intención de + infinitive (I plan to/ I intend to ...)

Me gustaría + infinitive (I would like to...)

2. Using infinitives after me gusta/no me gusta/odiar/preferir :

You can also use an infinitive after opinion verbs such as *aimer*, *odiar* and *preferir*. They are usually translated with a **gerund** (a verb ending with -ing) in English:

Me gusta vivir à Newcastle - I like living in Newcastle.

Prefieres jugar al fútbol o al tenis? - Do you prefer playing football or tennis?

Odio beber café porque es asqueroso – She hates drinking coffee because it’s disgusting.

3. Opinions

Me gusta(n) - I like

Me gusta(n) **mucho** - I like a lot

No me gusta(n) **mucho** - I don’t like much

Prefiero – I prefer

Odio - I hate

No suporto - I can’t stand

4. Justification

Porque - because

Por lo tanto – therefore/so

Por consiguiente- consequently

5. Comparisons

Más.....que –more...than

Menos...que - less...than

Tan...como – as...as

6. Superlative

El/la más – the most

El/la menos – the least

El/la major – the best

El/la peor – the worse

7. Time phrases

Normalmente - normally

Usualmente - usually

Generalmente - generally

De vez en cuando/a veces – sometimes

Luego – next

Raramente - rarely

El fin de semana que viene– next weekend

La semana que viene- next week

El fin de semana pasado - last weekend

El mes pasado - last month

El verano pasado- last summer

Durante la cuarentena- during lockdown

¿Cuál es tu asignatura favorita? What is your favourite subject?

	1. El inglés	English
	2. El español	Spanish
	3. El francés	French
	4. El teatro	Drama
	5. El dibujo	Art
	6. El deporte	PE
	7. La informática	Computer Science
	8. La música	Music
	9. La tecnología	Technology
	10. La geografía	Geography
	11. La historia	History
	12. La religión	RE
	13. La educación personal y social	PSHE
	14. Las matemáticas	Maths
	15. Las ciencias	Science
	16. Las humanidades	Humanities
	¿Cuál es tu opinión? <u>What is your opinion?</u>	
	17. Es	It is
	18. Interesante	Interesting
	19. Práctico	Practical
	20. Útil	Useful
	21. Ínutil	Useless
	22. Fácil	Easy
	23. Difícil	Difficult
	24. Aburrido	Boring
	25. Emocionante	Exciting
	26. Creativo	Creative
	27. Importante	Important

¿Qué llevas? What do you wear?

	28. Llevo...	I wear
	29. Una chaqueta	Blazer
	30. Un jersey	Jumper
	31. Una camisa	Shirt
	32. Una camiseta	T-shirt
	33. Una corbata	Tie
	34. Una falda	Skirt
	35. Unos calcetines	Socks
	36. Unos pantalones	Trousers
	37. Unos zapatos	Shoes
	38. Unas medias	Tights

¿Cómo es tu uniforme escolar? What is your school uniforme like?

	39. Es...	It is ...
	40. Feo	Ugly
	41. Bonito	Pretty
	42. (in)cómodo	(un) comfortable
	43. Caro	Expensive
	44. Barato	Cheap
	45. De moda	Fashionable
	46. Pasado de moda	Unfashionable

La jornada escolar The school day

	47. Salgo de casa	I leave home
	48. Voy al insti	I go to school
	49. Las clases empiezan...	Classes start...
	50. Las clases terminan...	Classes end ...
	51. Dura...	It lasts ...
	52. El recreo	Break
	53. La hora de comer	Lunch
	54. Por la mañana	In the morning
	55. Por la tarde	In the afternoon

¿Cuáles son las reglas? What are the rules?

56. (no) se debe	You must(n't)
57. (no) se puede	You can('t)
58. Hay que	You have to
59. Está prohibido	It is forbidden
60. Escuchar en clase	To listen in class
61. Usar el móvil en clase	To use your phone in class
62. Llevar joyas	To wear jewellery
63. Llevar maquillaje	To wear make up
64. Llevar zapatillas de deporte	To wear trainers
65. Dañar las instalaciones	To damage the facilities
66. Respetar el turno de palabra	To wait your turn to speak
67. Comer chicle	To chew gum
68. Hacer los deberes	To do homework

¿Qué quieres hacer en el futuro? What do you want to do in the future?

69. Quiero / Me gustaría ...	I want / I would like ...
70. Aprobar mis exámenes	To pass my exams
71. Sacar buenas notas	To get good grades
72. Hacer un aprendizaje	To do an apprenticeship
73. Buscar trabajo	To look for a job
74. Trabajar como voluntario	To work as a volunteer
75. Viajar por el mundo	To travel the world
76. Tener hijos	To have children
77. Casarme	To get married
78. Aprender a conducir	To learn how to drive
79. ¿Qué vas a ser en el futuro?	What are you going to be in the future?
80. Voy a ser ...	I am going to be ...
81. Médico/a	Doctor
82. Profesor(a)	Teacher
83. Abogado/a	Lawyer
84. Mecánico	Mechanic
85. Fontanero	Plumber
86. Bombero	Firefighter
87. Veterinario	Vet
88. Peluquero	Hairdresser

<u>The present tense</u>	AR verb	ER verb	IR verb
yo (I)	-o	-o	-o
tu (you)	-as	-es	-es
él/ella (he/she)	-a	-e	-e
nosotros/as (we)	-amos	-emos	-imos
vosotros/as (you all)	-áis	-éis	-ís
ellos/ellas (they)	-an	-en	-en

The future tense in Spanish

You can talk about the future by using the **near future** tense.

Use part of the verb IR + a + the infinitive to say what you are **going** to do.

Este tarde **voy a jugar** al tenis. *This evening I am going to play tennis.*

Mañana Paul **va a hacer** un pastel. *Tomorrow Paul is going to make a cake.*

You can also use the following phrases with an infinitive to refer to the future.

Quiero = I want

Me gustaría = I would like

Quisiera = I would like

Espero = I hope

Adjectives describe nouns e.g. a **black** blazer.

In Spanish, adjectives normally go after the words they are describing e.g. una camisa azul (a blue shirt) and they have to agree with the noun they are describing.

Adjectives must agree with the noun (or pronoun) they describe in gender and in number.

This means that if the noun an adjective describes is feminine, the adjective must be feminine e.g. una chaqueta negra (a black blazer).

If that same noun is also plural, the adjective will be feminine AND plural as well e.g. las medias negras (black tights).

Comparatives – to express more or less than

... **es más...adjective...que** - is more...adjective...than

... **es menos ...adjectiveque** - is less...adjective... than

... **es tan...adjective....como** – is as...adjective...as

For example:

*El inglés es **más** interesante **que** la geografía. (English is more interesting than Geography)*

*La historia es **menos** activa **que** la educación física. (History is less active than PE)*

*El francés es **tan** difícil **como** las matemáticas. (French is as difficult as maths).*



Verbs and the present tense in French

The infinitive

When you look up a verb in the dictionary, you find its original, unchanged form which is called the **infinitive** (manger, boire, jouer, visiter, habiter, aller etc.). The infinitive ends in **-re, -er** or **-ir**.

Forming the present tense in French

Take off the last 2 letters of the infinitive (**-re, -er** or **-ir**) and add the following endings depending on the pronoun:

*Important! There are some key irregulars to learn which don't follow this pattern – aller (as shown here), être, avoir and faire are really important!

	RE verb	ER verb	IR verb
Je (I)	-s	-e	-s
tu (you)	-s	-es	-s
il/elle (he/she)		-e	-t
nous (we)	-ons	-ons	-issons
vous (you all)	-ez	-ez	-issez
ils/elles (they)	-ent	-ent	-issent

Verbs and the near future tense in French

You can talk about the future by using the **near future** tense.

Use part of the verb **ALLER** + a + the infinitive to say what you are **going** to do.

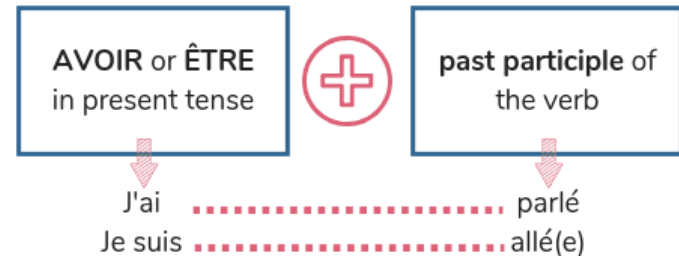
Ce soir je vais jouer au tennis. *This evening I am going to play tennis.*

Demain Paul va a faire un gateau. *Tomorrow Paul is going to make a cake.*

Aller (to go)

Je vais	I am going
Tu vas	You are going
Il/elle va	He /she/one is going
Nous allons	We are going
Vous allez	You (lot) are going
Ils/elles vont	They are going

Verbs and the past tense in French



AVOIR (present)
J'ai
Tu as
Il /elle a
Nous avons
Vous avez
Ils /elles ont

ÊTRE (present)
Je suis
Tu es
Il /elle est
Nous sommes
Vous êtes
Ils /elles sont

-ER	⇒	É (parlé)
-IR	⇒	I (fini)
-RE	⇒	U (vendu)
être	⇒	été
avoir	⇒	eu
faire	⇒	fait
pouvoir	⇒	pu
vouloir	⇒	voulu

1. Expressing FUTURE intentions :

J'ai l'intention de + infinitive (I plan to/ I intend to ...)

Je voudrais + infinitive (I would like to...)

2. Using infinitives after j'aime/je m'aime pas/je déteste/je préfère :

You can also use an infinitive after opinion verbs such as aimer, détester and préférer. They are usually translated with a **gerund** (a verb ending with -ing) in English:

J'aime habiter à Newcastle - I like living in Newcastle.

Tu préfères jouer au foot ou au tennis? - Do you prefer playing football or tennis?

Je déteste boire du café parce que c'est dégoûtant – She hates drinking coffee because it's disgusting.

3. Opinions

J'aime - I like

J'aime beaucoup- I like **a lot**

Je n'aime pas beaucoup- I don't like **much**

Je préfère – I prefer

Je déteste - I hate

Je ne peux pas supporter - I can't stand

4. Justification

Parce que - because

Ainsi– therefore/so

Par conséquent - consequently

5. Comparisons

Plus.....que –more...than

Moins...que - less...than

Aussi...que – as...as

6. Superlative

Le/la plus – the most

Le/la moins – the least

Le/la mieux – the best

Le/la pire – the worse

7. Time phrases

Normalement - normally

D'habitude - usually

Généralement - generally

Quelquefois – sometimes
week

Ensuite – next

Rarement - rarely

Le weekend prochain– next weekend

La semaine prochaine - next

Pendant le confinement - during lockdown

Le weekend dernier - last weekend

Le mois dernier - last month

L'été dernière - last summer

Les activités	Activities
aller	To go
jouer	To play
manger	To eat
visiter	To visit
faire	To do
danser	To dance
boire	To drink
regarder	To watch
écouter	To listen
lire	To read
acheter	To buy
finir	To finish
voir	To see
écrire	To write
dormir	To sleep
nager	To swim
rencontre	To meet
voyager	To travel
chanter	To sing
envoyer des SMS	To text
contacter	To contact
téléphoner	To call
cuisiner	To cook
télécharger	to download
travailler	To work
aider	To help
méditer	To meditate
se relaxer	To relax
se détendre	To rest

Les endroits	Places
Chez moi	At home
Chez mon ami	At my friend's house
Chez mon père	At my dad's
Chez ma mère	At my mum's
Chez mes grand-parents	At my grand-parents'
Dans ma chambre	In my room
Dans le salon	In the living room
Dans le jardin	In the garden
Dans ma zone	In my neighbourhood
En Angleterre	In England
À l'étranger	Abroad
En ville	In town
À la campagne	In the countryside
À la montagne	In the mountains
Au bord de la mer	By the seaside

Adjectifs	Adjectives
Aimable	Kind
Agréable	Pleasant
Content(e)	Happy
Bavard(e)	Chatty
Beau/belle	Beautiful
Amusant(e)	Fun
Mignon(ne)	Cute
Joli(e)	Pretty
Propre	Clean
Parfait	Perfect
Rapide	Fast
Riche	Rich
Sage	Wise
Timide	Shy
Travailleur/se	Hard-working
Triste	Sad
Ennuyeux/se	Boring
Embêtant(e)	Annoying
Sérieux/se	Serious
Facile	Easy
Difficile	Difficult
Stricte	Strict
Moche	Ugly
Bruyant(e)	Noisy
Impoli(e)	Rude
Horrible	Horrible/Awful
Paresseux/se	Lazy
Sportif/ve	Sporty
Enrichissant/e	Enriching
Intéressant(e)	Interesting
Vieux/vieille	Old
Relaxant	Relaxing

Healthy living key verbs		
Se coucher	to go to bed	
Avoir envie de	to fancy, to feel like	
Courir	to run	
Se droguer	to take drugs	
Se souler	to get drunk	
Se sentir bien/mal	to feel well/ill	
Être au régime	to be on a diet	
Être en forme	to be fit	
Éviter	to avoid	
Fumer	to smoke	
Essayer de (+ infinitive)	to try to	
Se lever	to get up	
Rester en forme	to keep fit	
S'inquiéter	to worry	
Goûter	to try, to taste,	
Se sentir	to feel	
Vaincre	to overcome	
Avoir mal	to have a pain (in)	
Être fatigué	to be tired	



9.11 My School Life – Vocabulary List



Quelle est ta matière préférée?	What is your favourite subject?
L'anglais	English
L'espagnol	Spanish
Le français	French
Le théâtre	Drama
Le dessin	Art
Le sport (L'EPS)	P.E.
L'informatique	I.C.T. (Computer Studies)
La musique	Music
La technologie	D.T.
La géographie	Geography
L'histoire	History
La religion	R.S. (Religious Studies)
L'éducation civique	P.S.H.E (Health and Wellbeing)
Les mathématiques	Maths
Les sciences	Science

Quelles sont les règles?	What are the rules?
On ne doit pas	You must not
On ne peut pas	You can not
Il faut	You must
Il est interdit de/d'	It is forbidden to
Écouter en classe	(to) listen in class
Utiliser son portable en classe	(to) use your phone in class
Porter les bijoux	(to) wear jewellery
Porter le maquillage	(to) wear make-up
Porter les baskets	(to) wear trainers
Manquer les cours	(to) miss lessons
Être à l'heure	(to) be on time
Mâcher du chewing-gum	(to) chew chewing-gum
Faire ses devoirs	(to) do homework

Qu'est-ce que tu en penses?	What do you think of it?
C'est/Ce n'est pas	It is/It is not
Intéressant (e)	Interesting
Pratique	Practical
Utile/inutile	Useful/not useful
Facile/Difficile	Easy/difficult
Ennuyeux (se)	Boring
Passionnant (e)	Exciting
Créatif (ve)	Creative
Important (e)	Important
Trop	Too
Très	Very
Assez	Quite
Un peu	A bit (a little)
du tout	At all

Qu'est-ce que tu voudrais faire dans le futur?	What would you like to do in the future?
Je vais	I am going
Je voudrais/J'aimerais	I would like
Réussir mes examens	To pass my exams
Recevoir des bonnes notes	To get good results
Faire un apprentissage	To do an apprenticeship
Chercher du travail	To search for a job
Faire du bénévolat	To do voluntary work
Voyager le monde	To travel the world
Avoir des enfants	To have children
me marier	To marry
Apprendre à conduire	To learn to drive
Devenir	To become
Médecin/Vétérinaire	A doctor/a vet
Professeur/Avocat(e)	A teacher/a lawyer
Mécanicien(ne)/Plombier(ière)	A mechanic/a plumber
Pompier (ière)	A firefighter
Coiffeur(euse)	A hairdresser

Comment est ton uniforme scolaire?	What is your school uniform like?
Je porte	I wear
Il faut porter	You must wear
Une veste/ un blazer	A blazer/jacket
Un pull	A jumper
Une chemise	A shirt
Un t-shirt	A t-shirt
Une cravate	A tie
Une jupe	A skirt
Des chaussettes	Socks
Un pantalon	Trousers
Des chaussures	Shoes
Un collant	Tights
Moche	Ugly
Beau/belle	Beautiful
(In)confortable	(un)comfortable
Cher	Expensive
Pas cher/bon marché	Not expensive/cheap
À la mode	Fashionable
Démodé(e)	Old-fashioned

La journée scolaire	The school day
Je quitte la maison	I leave the house
Je vais au collège	I go to school
Les cours commencent à	Lessons start at
Les cours terminent à	Lessons end at
Ça dure	It lasts
La récréation	Breaktime
L'heure du déjeuner	Lunchtime
Le matin	The morning
L'après-midi	The afternoon
Le soir	The evening

<u>The present tense</u>	ER verb	IR verb	RE verb
Je (I)	-e	-is	-s
tu (you)	-es	-is	-s
Il/Elle/On (he/she/one)	e	-it	-
Nous (we)	-ons	-issons	-ons
Vous (you all)	-ez	-issez	-ez
Ils /Elles (they)	-ent	-issent	-ent

The future tense in French

You can talk about the future by using the **near future** tense.

Use part of the verb ALLER and the infinitive to say what you are **going** to do.

Ce soir, je vais jouer au tennis. This evening I am going to play tennis.

Demain, Paul va faire un gâteau. Tomorrow Paul is going to make a cake.

You can also use the following phrases with an infinitive to refer to the future.

Je veux = I want

Je voudrais = I would like

J'aimerais = I would like

J'espère = I hope

Adjectives describe nouns e.g., a **black** blazer.

In French, adjectives normally go after the words they are describing e.g., une chemise bleue (a blue shirt) and they must agree with the noun they are describing.

Adjectives must agree with the noun (or pronoun) they describe in gender and in number.

This means that if the noun an adjective describes is feminine, the adjective must be feminine e.g., une veste noire (a black blazer).

If that same noun is also plural, the adjective will be feminine **AND** plural as well e.g., les chaussettes noires (black socks).

Comparatives – to express more or less than

... **est plus + adjective + que** - is more...adjective...than

... **est moins + adjective + que** - is less...adjective... than

... **est aussi + adjective + que** – is as...adjective...as

For example:

L'anglais est plus intéressant que la géographie. (English is more interesting than Geography)

L'histoire est moins active que l'E.P.S. (History is less active than PE)





Le français est aussi difficile que les maths. (French is as difficult as maths).



Principles of Training (Term 3)

FITT is used to guide and develop fitness plans for individuals and to ensure suitable progression over time.

Smarter

	Frequency	Is how often you train a week, ensuring there are rest days. Beginners should have 3 sessions per week and build up to more
	Intensity	Is how hard you train. Factors- weight, distance, HR and time. Need to make sure you have a balance of load but not overtraining.
	Time	Is how long you are training for. Beginners should work for 20-30 mins when training aerobic fitness then increase to 45 – 60 mins when fitness levels increase.
	Type	Is what type of exercise you have chosen. Ensuring it is appropriate to the needs and ability of your client. Making sure it is varied to reduce boredom.

- S** – Specificity → The training must be matched to the needs and demands of the individual.
- M** – Measurable → Goals must be quantifiable to track progress.
- A** – Achievable → To ensure goals are set which will be met.
- R** – Realistic → Goals have to be within their reach.
- T** – Time Bound → A set period of time to reach the goal.
- E** – Exciting → The goal has to be motivated.
- R** – Recorded → The process to be recorded to the accountable of progress

Training Cycles

Periodisation → Are structured Training Cycles

Macro cycles → The main part of a meet their aim training programme, they are 1-year to 4-year training cycle. Macrocycle are divided in a number of mesocycles.



Mesocycle → These are monthly training cycles (unusually 4-24 weeks), used to help control work-to-rest ratios. Each mesocycles is divided into a number of micro cycle.

Nutrition (Term 4)

Nutrition is a huge part of living a healthy lifestyle, it is important to know which foods you should eat and how much you should consume. These food groups can be split into two categories; macronutrients and micronutrients.

Macronutrients: Required in large amounts on a daily basis (e.g., Carbohydrates, Protein)

Micronutrients: Required in smaller amounts, but essential for disease prevention and well-being (e.g., Vitamins, Minerals)

Carbohydrates 	Protein 
<p>Carbohydrates are your bodies most available source of energy. They can be stored in the muscles later for energy but excess carbs not required will be converted into fat.</p> <p><i>Simple:</i> These are sugars and a quick energy source. (e.g., Sugar, Sweets, Fizzy Drinks)</p> <p><i>Complex:</i> Broken down slowly to release energy over long periods (e.g., Bread, Pasta, Rice and Potatoes)</p>	<p>The main role of protein is to build and repair tissue. Can also be a secondary source of energy when carbs and fats are limited.</p> <p>On average Men should consume around 55g a day, whereas Women consume around 45g a day.</p> <p><i>Complex Proteins:</i> Meat, Milk and Fish.</p> <p><i>Incomplete Proteins:</i> Cereals, Bread and Beans.</p>
45-65% of diet	10-35% of diet

Fats	
<p>Fats are important for normal growth and development. They can also be important for energy as it has the most concentrated source of energy. Too much saturated fat in a diet can cause significant health problems.</p> <p>The government suggest Men should consume a maximum of 30g a day, compared to 20g for Women.</p> <p><i>Saturated Fats (Animal Products):</i> Meat, Dairy, Butter & Cream</p> <p><i>Unsaturated Fats (Plant Products):</i> Avocado, Nuts & Olives</p>	20-35% of diet

Vitamins

Vitamin A: Needed for normal functioning of eyes and keeps immune system healthy. (e.g., Green Vegetables & Carrots)

Vitamin B: Essential for the breakdown and release of energy from food (e.g., Eggs & Lean Meat)

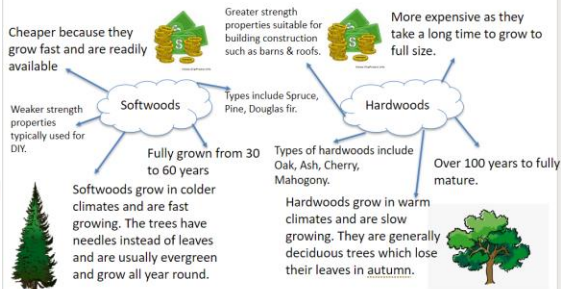
Vitamin C: Helps protect cells and keep them healthy, alongside healthy tissue. (e.g., Vegetables & Citrus Fruit)

Vitamin D: Needed for the absorption of calcium to keep bones healthy. (e.g., Fish, Eggs & Sunlight)

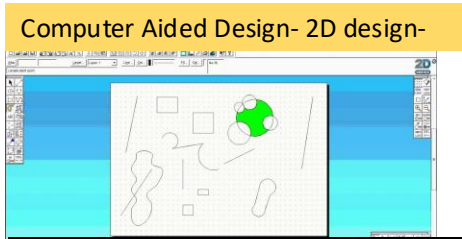
Calcium: Helps to build strong bones and teeth, ensuring that blood clots normally. (e.g., Milk & Green leafy Vegetables)

Iron: Helps with the formation of haemoglobin in red blood cells to transport oxygen. (e.g., Liver, Meat & Nuts)

Resistant Materials



	Hardwood	Softwood	Engineered wood
Origin	Deciduous trees that have leaves and seeds	Conifer trees that have needles and cones	Real timber, waste wood or a combination
Examples	Ash, beech, birch, cherry, oak, maple, and walnut	Cedar, fir, pine, spruce and redwood	Plywood, MDF, chipboard and veneered boards
General Characteristics	Slower growth rate and often higher density	Faster growth rate and often lower density	Large standard sized panels of varying density
Uses	High quality furniture, decorative woodwork, decks, flooring...	Building components, furniture, exterior cladding...	Furniture (shelves and cupboards), walls, counters...
Cost	Typically, higher cost	Typically, lower cost	Lower cost



- ### Advantages of CAD
- Increased accuracy of design compared to hand drawings.
 - Designs can be saved & edited for mistakes/ changes easily.
 - Can be exported to different formats for manufacture e.g DXF & STL.
 - Designs can be tested virtually instead of physically modelled.



Solder iron



Vacuum former



Laser cutter



File



Coping Saw



Tri-Square



Tenon Saw



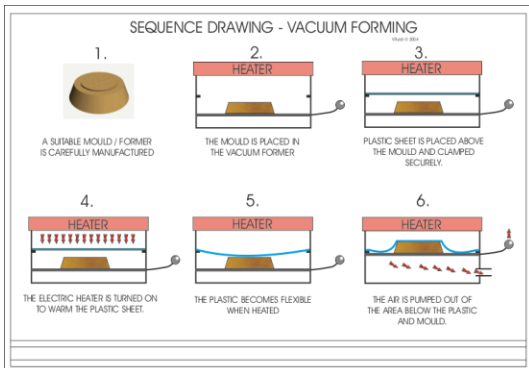
Bench Hook



Pillar Drill



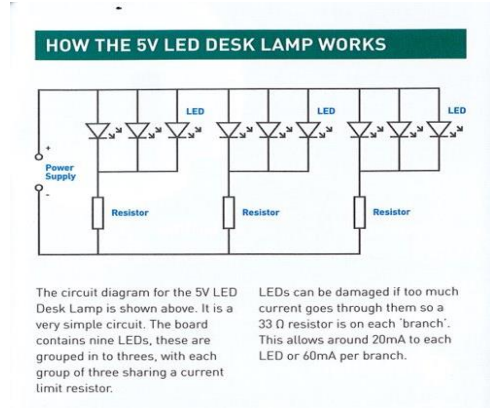
Vertical Sander



Polymers (plastics)

During this project you will use plastics. Its important you know the difference between the 2 main groups of plastics; **thermosetting plastic** & **thermoforming plastic**.

Thermoforming Plastic	Properties & Uses
Acrylic	Hard and shiny, resist weather well. Can be used to make baths, motorbike helmet visors and shop display signs.
Thermosetting Plastic	Properties & Uses
Melamine Formadehyde	Strong and scratch proof. Used to laminate chipboard to form kitchen worksurfaces.
	Thermosetting plastic Resist heat and fire. They undergo a chemical change when heated and moulded and permanently become hard and rigid.



Food Employability Skills – What do you need to get a job in the Food Industry?



Listening



Speaking



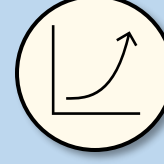
Problem Solving



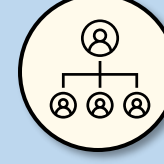
Creativity



Staying Positive



Aiming High



Leadership



Teamwork

Carbohydrates

Carbohydrates fall into 3 categories:

- **Starchy**
- **Sugars**
- **Fibre (non-starch)**

Starchy Carbs Include



- Bread
- Pasta
- Rice
- Cereals
- Oats
- Grains

Sugary Carbs Include:



- Fruits
- Soft drinks
- Sweets
- Desserts
- Sweet potatoes
- Some cereals

Fibrous Carbs Include:



- Vegetables
- Beans
- Whole grains

Allergy	What this means	Foods to avoid	Alternatives
Coeliac	Allergy to wheat/gluten. This means that eating gluten triggers an immune reaction which damages the lining of the small intestine.	Foods made with flour cannot be eaten including cakes, biscuits, pasta and bread.	Gluten free flour or flours made from other ingredients like rice, soya etc.
Nut allergy	Can cause anaphylactic shock where the throat swells until a person cannot breathe. They need to be treated with adrenalin.	Any nut-based products - Some people are allergic to some nuts but not others.	You need to check packets to ensure all ingredients are free from traces of nuts.
Fish and seafood	Can cause an increase in severe asthma. Itching of the mouth, skin reactions, and anaphylaxis causing swelling and possible death.	Any sea food, some everyday fish, and fish supplements	Use other meats and avoid any oils that may contain fish.
Egg allergy	Eggs have two allergenic parts, the yolk and the white. They can cause anaphylactic shock, skin reactions and upset stomach.	Any foods containing eggs including; ice cream, cakes, battered foods etc.	Egg replacer.
Lactose intolerance	The body is unable to digest lactose, a type of sugar mainly found in milk and dairy products. Symptoms commonly include skin reactions, Allergic conjunctivitis, nausea, abdominal pain, vomiting, or diarrhoea.	Any dairy products containing lactose including cheeses, creams, butter, milks etc.	Lactose free milks and dairy products.

Being Healthy

Staying healthy isn't just about maintaining the correct weight.



It is therefore possible to be the correct weight and unhealthy. Why? Because to be healthy we need the right combination of nutrients.

The easiest way to do this is to eat a wide variety of different foods from the Eatwell Guide and to understand which foods supply which nutrients and why we need them.

When choosing dishes and planning healthy foods the cooking method is important as it can turn a healthy food into a less healthy food.

Adding fat to help to cook food adds calories and excessive calories can lead to weight gain. If a saturated fat (butter, lard, ghee, goose fat) is used then this can lead to high cholesterol which is linked to coronary heart disease. If an unsaturated fat (olive oil, rapeseed, vegetable or sunflower oil) is used this is better for our health but still high in calories.

Potatoes are a good choice of food to consider when understanding how the method of cooking can affect health as they can be cooked in so many ways.

- For example:
- Boiled potatoes = 83 kcals per 100g
 - Baked potatoes = 87 Kcals per 100g
 - Chips = 255 Kcals per 100g (more if they are fries)
 - Crisps = 532 Kcals per 100g

HEALTHIEST COOKING METHODS



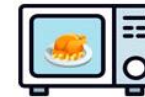
STEAMING

- No direct heat
- Retains nutrients
- Adds flavour



GRILLING

- Minimal oil
- Seal in flavour
- Reduce fat content



MICROWAVING

- No oil required
- Quick cooking
- Nutrients intact



STIR-FRYING

- Minimal oil
- Nutrients intact
- Great texture



POACHING

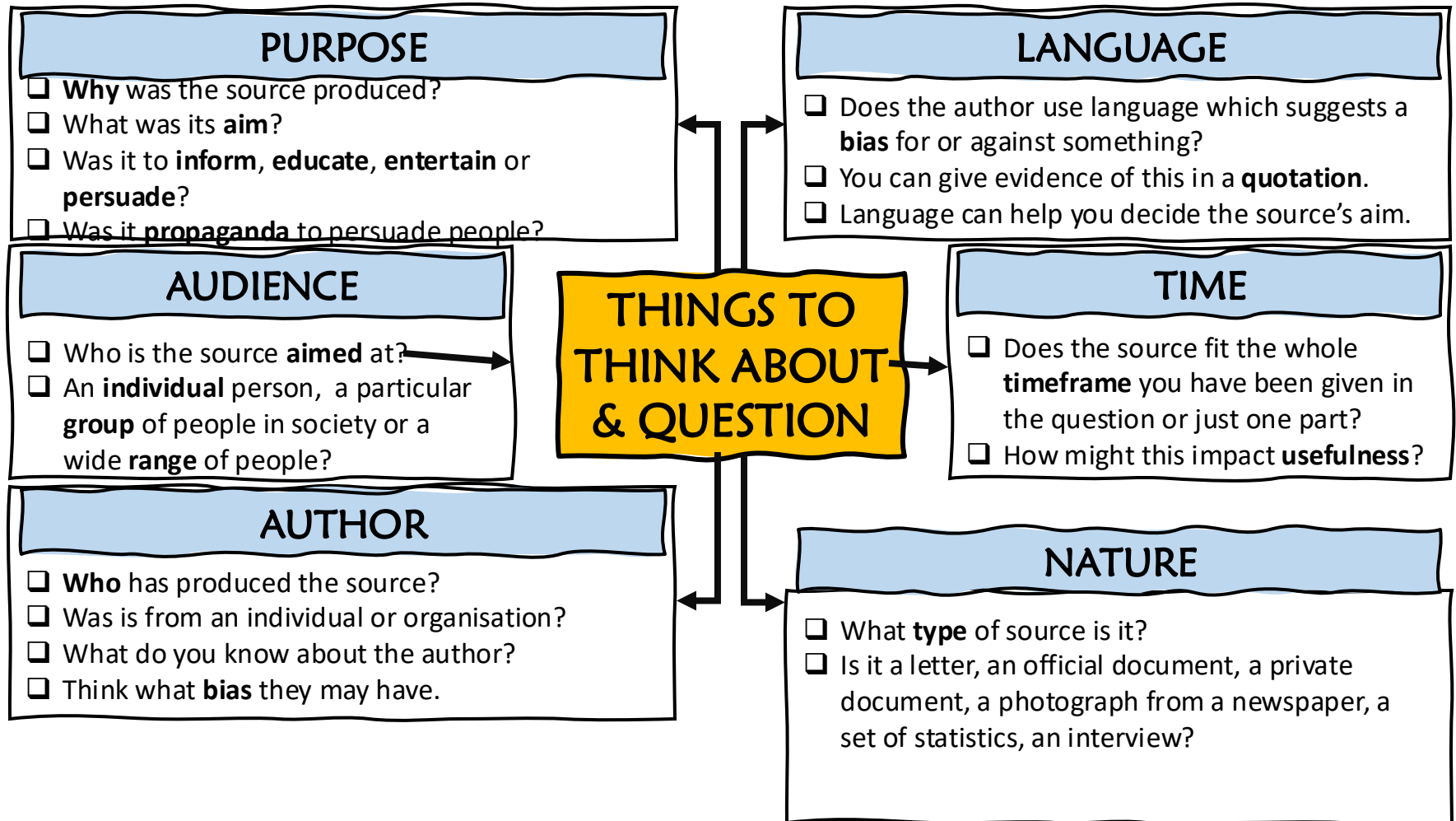
- Enhance nutrients
- Add flavours
- Reuse nutrient stock



NO COOKING

- No oil
- Nutrients not lost
- Taste enhanced in partial cooking

How Useful Analysis Sheet (PLANT)



What can you **infer** from these sources about the Nazi Party's use of the police?

Infer means to workout

Source A

Himmler addressing the Nazi Police Committee for Police Law in 1936.

It does not matter in the least if our actions are against some clause in the law. In my work for the Fuhrer and the nation, I do what my conscience and common sense tells me is right.

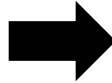
This is the content of the source

This is the Provenance this gives you Information about The source

Sources:
Sources can be anything from the time for example; Photos, Diaries, witness statements, speeches
You might be asked to make an inference from an interpretation, these have been wrote after the event by historians and are secondary sources.

THE SS – ‘Protection Squad’

- ❑ The **SS** were a police organisation which controlled all other police units. They were led by **Heinrich Himmler**. They were originally set up as **elite bodyguards** for Hitler to rival the SA. It was the SS who Hitler used to attack the SA leaders after the Night of the Long Knives in 1934.
- ❑ The SS were given smart **black uniforms** as a way to make them stand out and to make them look **intimidating**.
- ❑ The SS had to be **totally loyal** to Hitler and Himmler believed that the SS could use any methods they wanted to protect Hitler and the Nazis even if this meant acting violently.
- ❑ Himmler was very careful about the men he recruited to the SS. He looked for men who could prove they were from ‘racially pure’ Aryan families and expected his SS men to marry racially pure wives.



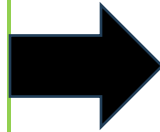
THE GESTAPO

- ❑ The Gestapo were a **non-uniformed, undercover** secret police force. They were set up in 1933 by Goering but by 1936 **Reinhard Heydrich** became leader.
- ❑ The main aim of the Gestapo was to identify anyone who opposed the Nazis. They **spied** on people, **tapped phones** and used **networks of informers** to identify suspects. The Gestapo were also given permission to use **methods of torture** when questioning suspects to gain confessions.
- ❑ The Gestapo were so powerful as they were **feared by everyone** in Germany. It was impossible to tell them apart from members of the public as their job was to blend in. In 1939, 160,000 people were arrested for opposing the Nazi regime.
- ❑ Most historians agree that the **fear** of the Gestapo was more powerful than the power they actually had. There were never any more than 30,000 Gestapo officers to watch over a population of over 80 million people. However, the public always believed that they were being watched by the Gestapo and so the fear of them was hugely significant.

1933-39: The use of propaganda and censorship to control and influence the German people

CENSORSHIP

Censorship is when certain types of information is **banned**. Censorship stopped people from reading about or listening to the ideas that the Nazis disliked. For example, the banning of newspapers, radio stations, types of music or film. It controlled people's beliefs by stopping them from accessing ideas that were different from the Nazi Party.



PROPAGANDA

Propaganda is the opposite of censorship. Instead of banning ideas, it creates them. Propaganda in Nazi Germany usually involved the media, such as newspapers, radio, posters and film. These were used to persuade the public to share the beliefs of the Nazis. The Nazis controlled every aspect of the media.

Examples of Propaganda



Uniform and objects



In January 1930, Hitler was appointed **Chancellor**. However, his power was still limited. There was still the rules of the Weimar Constitution that Hitler had to stick to. President Hindenburg remained the most powerful person with Hitler only second in command as Chancellor. Finally, only around 1/3 of politicians in the Reichstag (German parliament) were members of the Nazi Party. However, there were five key events which allowed Hitler to declare himself the ultimate leader or Fuhrer of Germany. By August 1934, Hitler had created a **dictatorship** where no other person or political party had any power.

**EVENT #1- The Reichstag Fire
(February 1933)****What happened?**

The German parliament building was destroyed by a **massive fire** in February 1933. A young communist was caught by building with matches and firelighters by the police. He confessed and was found guilty of the fire. He was then executed in prison in January, 1934.

**EVENT #2- The Enabling Act
(March 1933)****What was the Enabling Act?**

The Enabling Act was the name of a law created by Hitler. If it was voted for, the Enabling Act would simply allow Hitler to make new laws without ever needing to get the support of other politicians in the Reichstag. Put simply, the Enabling Act would bring an end to democracy in Germany.

EVENT #3- Removing Opposition (May - July 1933)**Hitler Banned Political Parties**

In May 1933, Hitler sent the SS to the offices of other political parties, arrested their leaders, destroyed their newspapers and took their party funds. In July 1933, Hitler banned all other political parties in Germany.

**EVENT #5- The Death of Hindenburg
(August 1934)**

On 2nd August, 1934, **President Hindenburg died** aged 87. This automatically meant that Hitler took over **supreme power**. He declared himself Germany's **Fuhrer** and added all of the President's powers to those he already had.

EVENT #4- The Night of the Long Knives (June 1934)**What was the Night of the Long Knives?**

This was the name given to the evening on 30th June, 1934 when Hitler executed the leader of the SA, **Ernst Rohm** with around 100 other members of the SA. More than 1,000 others were arrested.

Nazi Policy and Laws Aimed at Women

1933: The Law for the Encouragement of Marriage

Gave loans worth 8 months wages for German couple to marry. The loans only available if the women gave up work. For each child born, ¼ loan was paid off.

1933: Women were **banned from professions** such as teachers, doctors and government workers.

1933: **The Band of German Maidens (BDM)** was the young female version of the Hitler Youth. After 1933 it gained huge popularity.

1934: School text books were re-written for girls to teach the ideas of **Kinder, Kirche Kuche**

1934: All **women's social groups** forced to be part of the Nazi Party or banned.

1934: **Gertrude Scholtz-Klink** was made **Reich Women's Leader**.

1938: The Cross of Honour for the German Motherhood

Awarded on Mother's Day and given as a **medal** for women with 4-5 children (**bronze**), 6-7 children (**silver**), 8 (**gold**). If a mother had 10 children, she was expected to call it 'Adolf' and name Hitler as the godfather. In 1939, 3 million women were awarded the medal.

1938: **The Reich Marriage Law** - A wife could be legally **divorced** if she would not or could not have children.

1935: Lebensborn - (Fountain or Spring of Life) :

- ❑ This was a programme to encourage the birth of **pure 'Aryan' children**. It provided childcare and money for women who had children with SS officers.
- ❑ **Lebensborn homes** were opened. One home helped over 540 mothers give birth in 3 years.
- ❑ Single women 'of good blood' would be made pregnant by an SS man and their child would be given to a deserving German family for adoption.
- ❑ **The Nuremberg Race Laws** made marriage between a German and a Jew illegal.

1937: **Grammar schools** for girls which prepared girls for university were banned. The number of female university students fell from 17,000 (1932) to 6,000 (1939).

1939: 1 million women had been to **Nazi run courses** on childcare & cooking run by the **German Women's Enterprise**.



Keyword	Definition
Adaptation	The process of change in order to deal with a situation. In this instance, changing behaviours to deal with changes in our climate. Learning to live in a warmer world
Climate Change	A long-term change in the Earth's climate, especially a change due to an increase in the average atmospheric temperatures
Climate Crisis	A situation characterised by the threat of highly dangerous, irreversible changes to the global climate
Development	The progress of a country and the linked improvement to quality of life
Economy	The wealth of a country
Enhanced Greenhouse Effect	Increased global warming due to human activity
Extreme Weather	A weather event is significantly different from the average or usual weather pattern. This may take place over one day or over a period of time e.g. a flash flood or heat wave.
Fossil Fuels	Non-renewable energy sources - coal, oil and gas
Greenhouse Effect	Warming of the lower atmosphere by heat released from earth
Greenhouse Gases	Gases such as Carbon Dioxide and Methane, which absorb heat from earth
Mitigation	The action of reducing something. In this instance, actions to reduce greenhouse emissions
Policy	A policy is a set of principles to guide actions in order to achieve a goal
Sustainability	When materials and resources are used in a way that will balance the needs of the present without compromising the future, the ability to maintain something such as economic growth
Glacial Period	A period of global lower temperatures
Inter-glacial Period	A period of increasing global temperatures

Activism is the policy or action of using vigorous campaigning to bring about political or social change.



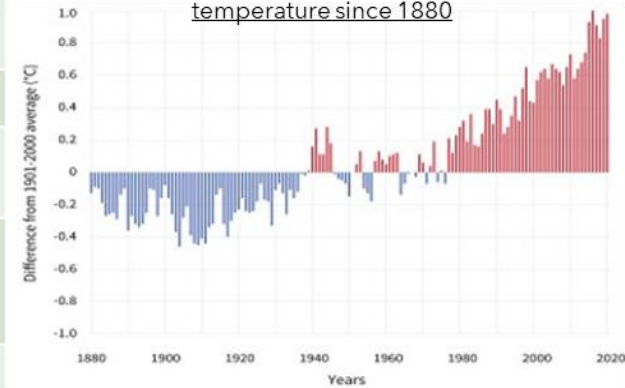
Campaigning is working in an organised and active way towards a particular goal.

Protesting -

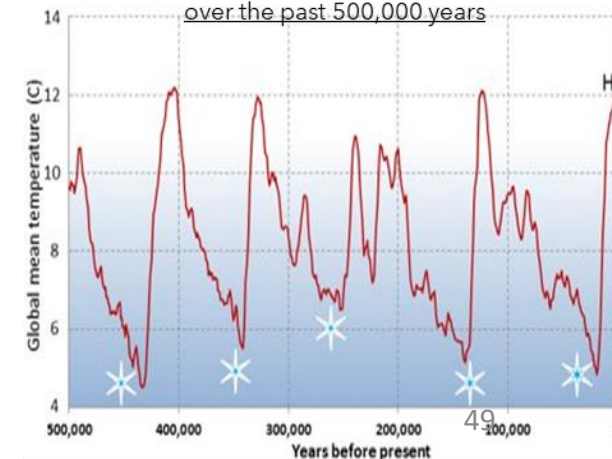
A protest is a public expression of objection, disapproval or dissent towards an idea or action, typically a political one.



A graph showing the changes in global temperature since 1880



Graph showing warm and cold periods over the past 500,000 years



Why should we care about the ocean?

OUR WORLD OCEAN provides

THE AIR WE BREATHE

>50% The ocean produces over half of the world's oxygen and stores 50 times more carbon dioxide than our atmosphere.

CLIMATE REGULATION

70% Covering 70% of the Earth's surface, the ocean transports heat from the equator to the poles, regulating our climate and weather patterns.

TRANSPORTATION

76% Percent of all U.S. trade involving some form of marine transportation.

RECREATION

From fishing to boating to kayaking and whale watching, the ocean provides us with so many unique activities.

ECONOMY

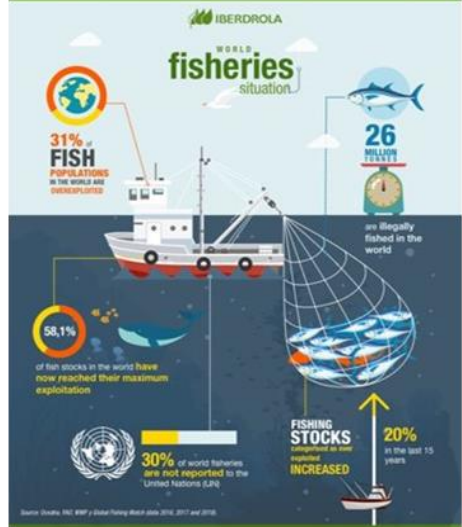
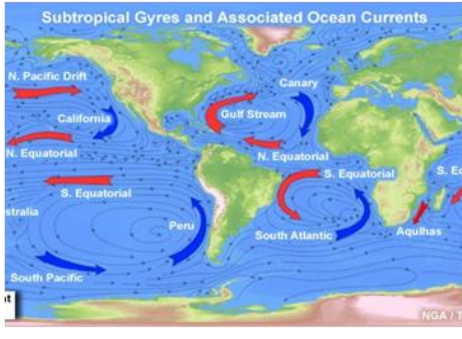
\$282 billion Amount the U.S. ocean economy produces in goods and services. Ocean-dependent businesses employ almost 3 million people.

FOOD

The ocean provides much more than just seafood. Ingredients from the sea are found in surprising foods such as peanut butter and soy milk.

MEDICINE

Many medicinal products come from the ocean, including ingredients that help fight cancer, arthritis, Alzheimer's disease, and heart disease.



BENEFITS OF HEALTHY OCEANS GLOBALLY

LIVELIHOODS

90% of the people who derive livelihoods from fishing live in developing countries

About **350 million jobs** are linked to the oceans globally

Tourism is the world's largest industry

The marine tourism industry provides **200 million jobs** worldwide

MARINE TOURISM

FOOD

1 Billion people depend on fish for their primary source of protein

COASTAL PROTECTION

Wetlands, seagrass beds, mangroves and coral reefs are a natural defense to protect coastlines

CLIMATE

5X more carbon is stored by coastal habitats than by tropical forests

RESILIENCE

Healthy oceans will better be able to cope with negative impacts

Atlantic Overfishing: Europe's Worst Offenders

Share of total allowable catch (TAC) in excess of scientific advice in the northeast Atlantic (2019)*

Member State	Excess TAC (%)	Excess TAC (tonnes)
Sweden	52.4	17,369
United Kingdom	24.3	106,925
Ireland	21.7	34,052
Denmark	19.7	49,914
Germany	18.0	20,620
The Netherlands	13.5	31,910
Belgium	10.4	3,009
France	9.4	27,230
Spain	6.6	16,689
Portugal	3.8	3,662

* Scientific bodies provide information on the state of fish stocks and recommended catch levels for sustainability. Every year, fisheries ministers agree on a total allowable catch for commercial fish stocks.

Source: The Economics Foundation

Keyword	Definition
Biodiversity	The variety of plant and animal life in a particular habitat
Great Pacific Garbage Patch	Largest of five offshore plastic accumulation zones containing plastic pollution. It is located between California and Hawaii.
Microplastics	When larger bits of plastic break down into tiny particles
Gyre	A large circular ocean current
Deep ocean currents	Currents driven by density
Surface ocean currents	Currents driven by surface winds
Overfishing	Catching more fish than the natural system can replace leading to a reduction in fish number
TAC - Total Allowable Catch	The number of fish you are allowed to catch in a particular area
Food Security	Having enough food to supply demand
Sustainable Fishing	Respecting habitats and leaving enough fish in the ocean so that fish numbers can be regulated

YEAR 9 ART – THE PRESENT

Content: In this project you learn to recognise that Art helps us to understand and negotiate our emotions and place within the world. Art can influence the way we think and act as individuals, and as a society. Artwork can encourage debate & thought around current world issues and encourage you to look outside of ourselves.

Develop skills- drawing, shading, painting, appropriation, using materials to demonstrate the influence of other artists in your own work and presentation

Outcome- Create a personal response related to the themes & artists.

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THE ENVIRONMENT



Ravi Koranga: Plastic Pollution



IDENTITY



Above: A painting by Basquiat, who died aged 27, is most expensive at auction of any US artist, also breaking record for a black artist.



Marc Quinn



EQUALITY

Keywords:
 Culture
 Connectivity
 Identity
 Activism
 Inequality
 Ethnicity
 Values
 Consumerism
 Globalisation
 Protest
 Rebellion

Research
 We will be developing independent research skills that will allow you to apply skills and techniques from artists you like to your personal responses.
 The techniques are also very useful in other subjects and will help you to prepare for higher levels of schooling as many subjects at A-Level and Undergraduate are reliant on being able to produce high quality research.

Analysis
All artist research pages should be annotated and include:
A Title = The artist's name
 • Describe the work-what does it look like? Use the formal elements i.e., colour, line etc.
 • What techniques/materials were used?
 • What is your opinion of the work? What ideas do you have your own that come to mind?
Sentence starters
 I like/dislike the way the artist has used...because...
 I think the colour scheme used is effective because...
 I think the artist has been inspired by...because...
Evaluation of Your Artwork-
 What inspired you to create the piece?
 What techniques did you use and why?
 What does it mean to you?
 How is it relevant to your idea?
Sentence starters
 The technique I have used is...
 The skill/technique I found most difficult was...because...
 I think my work is successful because...

WHA Religion and World Views

Keyword	Definition
Persecution	Cruel or unfair treatment, especially because of race or religious or political beliefs.
Schism	A tear or split. In religion it is when the religion splits into opposing groups.
Denomination or Sect	A branch or group within a religion. For example, Sunni and Shia in Islam, or Catholic and Protestant in Christianity.
Islamophobia	The fear of, hatred of, or prejudice against the religion of Islam or Muslims in general.
Greater Jihad	The internal struggle to be a good Muslim
Lesser Jihad	To defend Islam from threat.
Homophobia	The dislike of or prejudice against gay people

YR9 – Does religion cause conflict?

1984 Massacre in India



Mahatma Gandhi was an Indian lawyer, politician, social activist, and writer who became

the leader of the nationalist movement against the British rule of India. As such, he came to be considered the father of his country.

In October 1984, a Sikh man called Beant Singh shot and killed the Indian Prime Minister, Indira Gandhi.

On November 1st 1984, when news broke that the person who had killed the prime minister was a Sikh, angry mobs across India started to attack Sikhs across India.

Sikhs were identified by their turbans, and dragged off trains, some mobs would shave Sikhs heads and beards, knowing these are holy symbols to them. Mobs went to Sikh villages and set them on fire killing many people.

In the capital city Delhi, Sikhs were burned to death, beaten, raped and shot. Many of these Sikhs had nothing to do with Bhindranwale and did not support his violent campaigns, they were targeted purely for being Sikh. Victims included women and children. 3000 Sikhs were killed in just Delhi and 50,000 had to flee the city and move to refugee camps.

Between 8000 and 17000 were murdered in the anti-Sikh riots across 40 cities in India.



Christian Missionaries in Japan

A missionary is someone who travels out into the world & preaches their religion. They hope to convert people to their religion & to bring their religion into a new area.

A timeline of Christians in Japan

1549

The first wave of Christian missionaries came with Portuguese traders in 1543, opening the way for Jesuit (Catholic) priests to follow. Their work saw dramatic early growth. By 1582 there are said to have been nearly 250 churches and 150,000 members.

1639

The sudden growth of the church threatened the Shogun's authority. The Shogun was the military leader of Japan. Christianity was banned. This became a time of horrific persecution described in Shusako Endo's book "Silence". Many Christians were martyred. The remaining church who were not killed for their faith went underground.

1853

The second wave began when Japan's isolation was broken by American desire to open up trade with Japan. Japan's ports opened to trade and protestant missionaries soon followed. Christianity officially remained a banned faith until 1871.

1945

The third wave came after World War II with the American occupation of Japan. They called for ten thousand missionaries and a million Bibles to heal Japan's hurts. Missionaries flooded in. The church grew dramatically for nearly two decades.

YR9 – Does religion cause conflict?

In 2013, the Russian government passed a bill which imposes fines for anyone who normalises or discusses 'non-traditional' sexual relationships. The intent of this bill is to discourage open discussion of homosexuality or any LGBTQ identities in public places or in the media.

"This is a step backward from the progress of civilisation in my country," Vitus Media, a spokesman for the Russian LGBT Network, said in a telephone interview. "Obviously this law will elicit aggression and violence, and responsibility rests with the lawmakers who voted in its favor."

To date, there have been a number of legal actions taken under the regional anti-LGBT propaganda laws. In St. Petersburg in particular, activists and performers, including international superstars like Madonna and Lady Gaga, have faced fines and legal proceedings for expressing support for the local LGBT community. One individual was arrested and fined in St. Petersburg for holding a sign supporting LGBT rights that sated simply "Gay is Normal." Six LGBT activists were also detained in front of the State Children's Library in Moscow in July with another "Gay is Normal" banner. 53

What is Jihad & how might it lead to Islamophobia?

The literal meaning of Jihad is struggle or effort. Muslims use the word Jihad to **describe three different kinds of struggle:**

- A believer's internal struggle to live out the Muslim faith as well as possible
- The struggle to build a good Muslim society
- Holy war: the struggle to defend Islam, with force if necessary

When can Muslims wage a Holy War (military jihad)?

There are several reasons, but the Qur'an (Muslim holy book) is clear that self-defense is always the underlying cause. Other reasons are:

- Strengthening Islam
- Protecting the freedom of Muslims to practice their faith
- Protecting Muslims against oppression, which could include overthrowing a tyrannical ruler



What a Jihad is not:

A war is not a Lesser Jihad if the intention is to:

- Force people to convert to Islam
- Conquer other nations to colonise them
- Take territory for economic gain
- Demonstrate a leader's power



How has this view of jihad led to Islamophobia?

In the late 20th and early 21st century, the Western media has focused on military (lesser) jihad as being the way that 'Muslims' operate. The media shows news clips and images of Muslims as terrorists, as suicide-bombers, paramilitaries and as extremists.

There **are** people who kill and terrorise in the name of Islam. There are people who kill in the name of many religions. It does not mean that all people who follow that religion are like that. Many of the groups that kill in the name of Islam are not even following the rules of lesser jihad that are laid down in Islam.

To brand all Muslims in this way is a form of persecution. It is the unfair treatment of a group of people who follow Islam. It is called Islamophobia. That word literally means 'the fear of Islam'. The media image that is shown of Islam and Muslims can be frightening. It creates fear and suspicion. That is how persecution works.

The Holocaust

During the second world war, the Nazi party, under the leadership of Adolf Hitler, tried to kill all Jewish people in Europe. The Nazis and their collaborators murdered six million Jewish people, including 1.5 million children. This terrible period in history is known as **the Holocaust**.

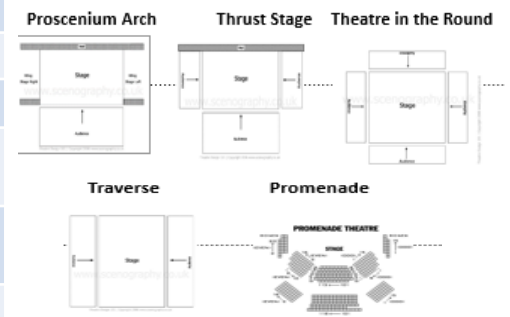
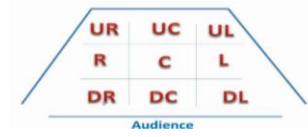
During the late 1920s and early 1930s, Germany was experiencing great economic and social hardship. The Germans had been defeated in the First World War and has been forced to pay huge reparations to the Allies. As a result, Germany suffered inflation and mass unemployment. Hitler blamed the Jews for this hardship and his anti-semitic views eventually became policy. This then led to a plan to exterminate all Jewish people.



Jews throughout Nazi-occupied Europe were forced to wear a badge in the form of a Yellow Star as a means of identification. This was not a new idea; since medieval times many other societies had forced their Jewish citizens to wear badges to identify themselves. The star was intended to **humiliate** Jews and to mark them out for **segregation and discrimination**. The policy also made it easier to identify Jews for deportation to camps.



Devising Drama Responding to Stimulus			
1	What ideas initially come to mind?	7	What research will you undertake?
2	What does this make you think of?	8	What did you find out?
3	How does the stimulus make you feel?	9	What do you want to show through your character?
4	What themes do you associate with your stimulus?	10	What was the initial purpose of your piece? What messages do you want to show?
5	What characters do you associate with your stimulus?	11	How do you want the audience to respond to your performance?
6	What settings do you associate with your stimulus?	12	How do you want your audience to respond to your characters?



Performance Skills

Movement								
13	Gait	The way you walk	17	Interaction	How you use eye contact and proxemics to show relationships	22	Tone	The way in which you use your voice to show mood
14	Posture	The position you hold your body when standing or sitting	Voice			23	Emphasis	Changing your voice by adding focus
15	Stance	The way you stand	18	Pitch	How high or low your voice is to show age or emotion	24	Intonation	The rise and fall of your voice
16	Body Language	How you express your emotions through your body	19	Pace	How fast or slow you speak	25	Accent	To show which country you are from
17	Facial Expression	Showing your character's emotions through the way in which you contort the muscles in your face	20	Pause	How you show emotion through gaps in your dialogue	26	Enunciation	How clearly you speak
16	Gesture	A small hand or head movement to communicate meaning	21	Volume	How high or low your voice is	27	Dialect	To show which region you are from

Year 9 Terms 3 & 4: Music for Moving Image

Musical Elements

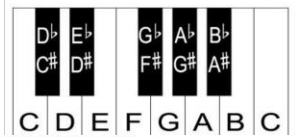
Dynamics	(volume)
Rhythm	(duration of notes)
Tempo	(speed)
Context	(background info)
Structure	(sections)
Melody	(organisation of pitches)
Instrumentation	(instruments & voices)
Texture	(layers)
Harmony	(chords & progressions)
Tonality	(key)

Instruments & Techniques

Strings	(Violin, Viola, Cello, Double Bass)
Pizzicato	(plucking strings)
Woodwind	(Flute, oboe, clarinet, bassoon)
Brass	(Trumpet, French Horn, Trombone, Tuba)
Percussion	(Timpani, Bass drum, Snare drum, triangle, maracas, bells)
Synthesisers	(computer generated sounds & FX)

Film Music Genres studied

- Horror, Romantic
- Sci-fi / Futuristic, Nature documentaries
- Video games



Composers

- John Williams
- Hans Zimmer
- Rachel Portman
- Jerry Goldsmith
- Danny Elfman
- Angela Morely
- Bernard Herman
- Enio Morricone
- Ramin Djawadi



Note names and Lengths

Name	Symbol	Rest Symbol	Value of each
Semibreve			4
Minim			2
Crotchet			1
Quaver			1/2
Semiquaver			1/4

Note Pyramid

Sharp raises the note by one semitone.
 Flat lowers the note by one semitone.
 Natural restores a note to its original pitch.

Pitch	Pitches is how high or low a piece of music, or a particular note, is.
Rhythm/Duration	Duration/rhythm means how long or short a note is.
Dynamics	Dynamics are how loud or quiet the music is played.
Tempo	Tempo is how fast or slow a piece of music is played.
Texture	Texture describes how melodies, rhythms and harmonies are layered in a piece of music.
Timbre/Sonority	Timbre (or sonority) describes the particular sound quality of an instrument or voice.
Structure	Structure (or form) is the overall plan of a piece of music.

Bringing moving image to life

Rhythm	The pattern of beats in a piece of music
Melody	The main tune
Chord	Three notes played together at the same time
Crotchet	Lasts 1 beat of a pulse
Minim	Lasts 2 beats of a pulse
Quaver	Lasts ½ beat of a pulse
Semibreve	Lasts 4 beats of the pulse
Pulse	A constant steady beat which keeps all the music together
Rest	Silence in music
Elements	The building blocks of music
Pitch	Whether the sound is high or low
Duration	The length of a sound
Tempo	The speed of the music
Timbre	The instruments used
Texture	How many layers of sound there are
Dynamics	The volume of the music
Structure	The order of the sections
Silence	No sound, the gaps in the music
Accompaniment	Sounds going on under the main tune
Introduction	Music heard at the start of a piece – before the main tune comes in
Sharp #	Played with the black note to the RIGHT (F# / G# / C#)
Flat b	Played with the black note to the LEFT (Bb / Eb / Ab)
Duet	A tune shared between parts equally
Fluency	No hesitations in a performance
Keyboard	An electric piano
Ukulele	A guitar-like instrument with four strings
Lyrics	Words
Conductor	Leader of the music – links between the singing and the instrumentalists
Audience	The people who watch and listen to a performance
Ensemble	A group of performers
Compose	Making up your own music
Perform	Playing music in front of an audience
Improvisation	Making up music on the spot
Bass line	A repeating pattern played at a low pitch
Verse	The section of a song that tells the story and has different words each time
Chorus	The catchy section of a song that is repeated lots
Round	One person starts singing then the next person starts 4 or 8 beats later
Balance	How well the different parts are mixed together
Contrast	Big changes between sections
Multitrack	Layering different parts one at a time by recording them

Key Terms	
Chromaticism	Using pitches outside of the key signature (using all 12 keys)
Cluster Chord	Musical chord using at least 3 adjacent notes (next to each other)
Sforzando	A sudden accent on a note or chord
Diatonic	Using notes from a normal 7 note scale (e.g. C major)
Consonant Chords	Chords that sound pleasing to the ear
Dissonant Chords	Chords that sound like they clash
Scalar	Moving up and down notes by step based on the scale of the music
Disjunct Melody	A tune that has large leaps within it
Conjunct Melody	A tune that moves by a step at a time
Pedal Notes	Long held low notes
Synthesiser	A device that creates synthetic sounds (computerized)
Leitmotif	A short piece of music that represents a person/place/object
Ostinato	A short pattern of notes that is repeated over and over again
Crescendo	The music gets gradually louder
Diminuendo	The music gets gradually quieter
Mickey Mousing	Where the music matches the action on the screen

Instrument Families in the Orchestra





Key vocabulary	Definition
1 Network	Two or more connected devices that can share data, peripheral devices and an internet connection.
2 LAN	Local Area Network - a network spanning one geographic location.
3 NIC	Network Interface Card – The physical connection between a computer and a network.
4 Hub	A “Dumb” device which forwards data to all devices on a network.
5 Switch	A “Smart” device which forwards data to a specific device on a network using its MAC address.
6 Router	A device for connecting computers and other network capable devices together to form a network.
7 Server	A powerful computer which manages access to a centralised resources or services in a network.
8 Wi-Fi	A facility allowing computers, smartphones, or other devices to connect to the Internet wirelessly.
9 Ethernet	The standard way to connect computers on a network over a wired connection.
10 WAN	Two or more LANs are connected together over a large geographic location.
11 GPRS connection	Wireless communication service that provides a way to transfer data between mobile devices.
12 Telephone line connection	A modem is used to connect the computer to the telephone line to connect to a WAN.
13 Firewall	Firewalls protect against unauthorised access to a computer system

System Security



	KEY VOCABULARY	DEFINITION
1	Social Engineering	Manipulating people so they divulge personal information such as passwords or bank account details.
2	Malicious Code	Often known as Malware. Common types include; Viruses, Spyware, Worms and Trojans.
3	Password	A string of characters that must be given in order to gain access to a computer.
4	Access Rights	Used to ensure that authorised people can access the resources they need.
5	Penetration Testing	Used to find any security weaknesses in a system.
6	Blagging	Act of creating a scenario to target a victim to perform actions that would be unlikely in ordinary circumstances.
7	Phishing	Phishing is a technique of fraudulently obtaining private information, often using email or SMS.
8	Pharming	Pharming is a cyberattack intended to redirect a website's traffic to another, fake site.
9	Shouldering	Shouldering is observing a person's private information over their shoulder e.g. cashpoint machine PIN numbers.
10	Computer Virus	Any computer program designed to replicate and damage other computer systems and software.
11	Trojan	A Trojan is a harmful piece of software, pretending to be useful.
12	Spyware	Spyware is a type of program that secretly records what you do on a computer.