



Wymondham High Academy

Year 8

Knowledge Organiser Autumn Term 2026

*"Education is the most powerful weapon which
you can use to change the world."*

Nelson Mandela



- And repeated retrieval and practice strengthens your memory and helps you remember more over a period of time.

The best way to use these knowledge organisers is to follow this simple guidance:



Look



Cover



Write



Check

Look at a specific aspect of your knowledge organiser.

Cover up the information

Write out the information from memory

Check and correct any errors, missing information or spelling mistakes.

Other ways to use learn via your Knowledge Organiser:

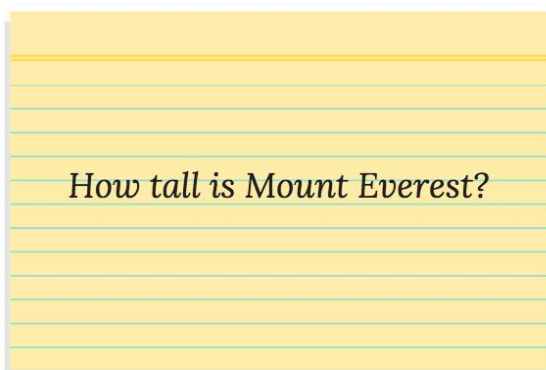
1) Revision Clocks:

- Start by drawing a basic clock.
- Break your knowledge organiser down into 12 subcategories.
- Make notes in each chunk of the clock.
- Revise each slot for 5 minutes, turn the clock over and then try to write out as much information as you can from one of the segments. Your brain will retain more information if you include images as well as keywords.



2) Flash Cards:

- Write the question on one side and on the other record the answer.
- Create for keywords and definitions
- Create for summarising arguments-agree and disagree
- Test yourself or work with a friend to make sure that you know all the key information for each topic.
- You could also use flashcards to test yourself on the definitions of key terminology. Remember you need to revisit information 10 times for it to be embedded in your long-term memory.



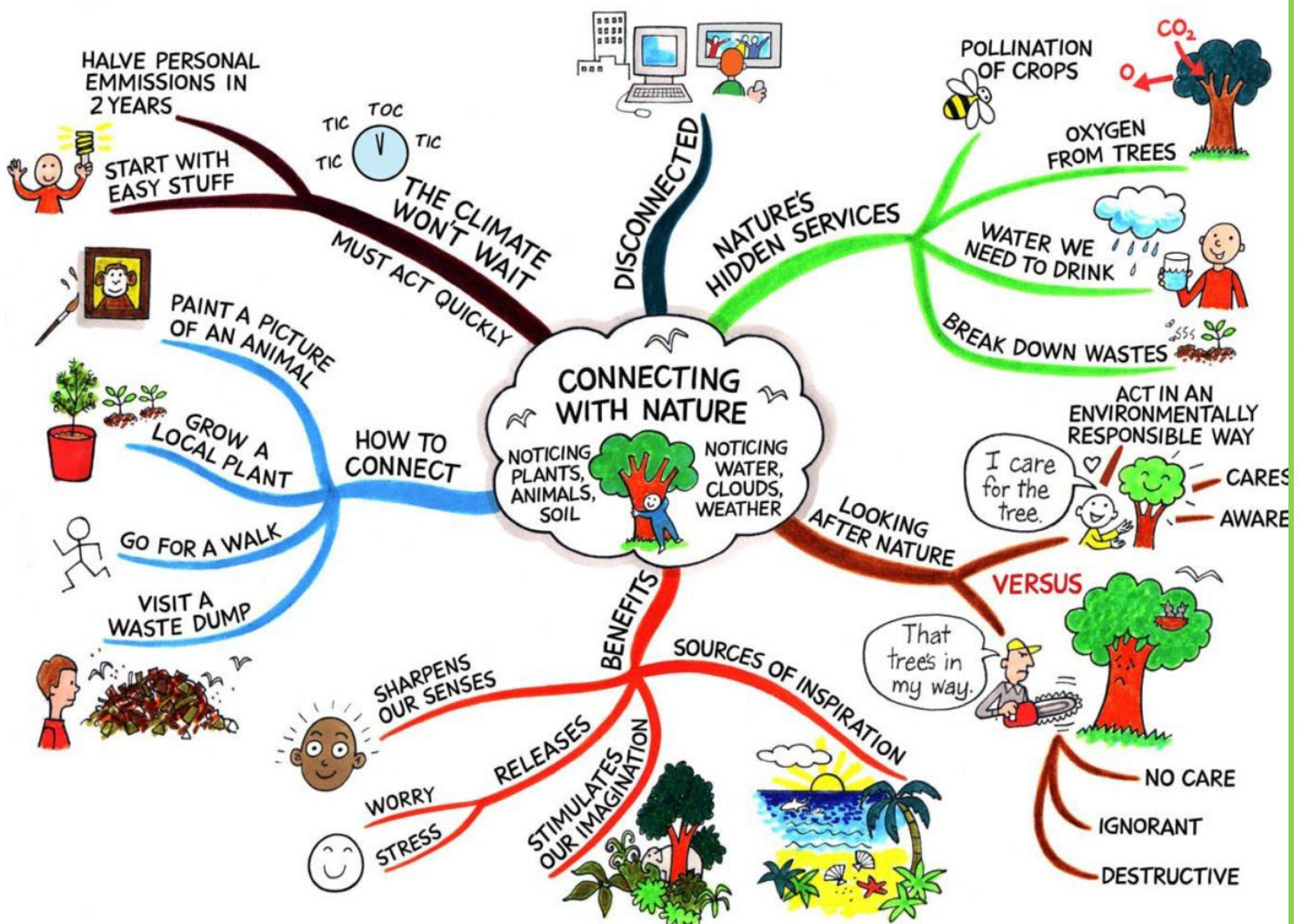
FRONT



BACK

3) Mindmapping:

- A mind map is a diagram that visually represents all the information you need to learn, present or analyse.
- Read all the information you have to remember.
- Start your mind map in the middle of a page adding a colourful image to the centre.
- Start in the middle with the name of your topic. Add branches for each subtopic that you need to revise.
- Build your network of information using colours and/or images.
- The map that develops will be a vibrant and colourful network of knowledge thanks links and organises the information radiating out from the central theme.
- When you have finished, try turning it back into sentences without looking at your subject knowledge organiser.
- Don't forget to green pen it. This technique will help embed key information into your long-term memory.



Knowledge organisers do have their limitations. It is not possible to include absolutely everything you need to know in a booklet like this. In addition to self-quizzing from these knowledge organisers, you will need to use a range of other revision strategies to support your learning, such as practising longer questions and solving problems over time.

Example homework timetable:

Homework until Oct half term is Maths and English only.

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Maths RPE	MFL 1 Drama	English PE	MFL 2 Art	Science
Week 2	Maths Technology	History Music	English Computing	Geography Science	Spare

For each subject homework in Year 7 will be no more than a 30-minute task. English, Maths and Science will set homework weekly. All other subjects will set homework fortnightly. You may decide to break each subject down into smaller chunks so you can revisit several times over the fortnight to aid your learning.

You will receive a homework exercise book and will be asked in your lessons to show proof of your learning. In your exercise book, you can complete your self-quizzing, Look, Cover, Write and Check activities etc. If you ever need a new homework exercise book, please ask your tutor for this.

Your teacher wants to praise you for your homework learning successes and your fortnightly quizzes will enable you to demonstrate your learning outside the classroom. Make sure you plan your time wisely, so you do not try to learn too much in one night and overload your brain!

Above and beyond:

If you want to develop your subject knowledge even further you could:

- Use Sparx Maths and complete the XP Boost and Target questions or have a go at the Independent work section on Sparx.
- Use GCSEPod to access KS3 additional courses in:
 - English,
 - Maths,
 - Science,
 - History,
 - Geography,
 - Spelling, Punctuation and Grammar and
 - Computing (from Oct 2024)

Click on a subject area and course modules that interest you. How many additional lessons can you complete?

How to access GCSEPod?

1. All students from Year 7-13 automatically gain access to GCSEPod when they enter the school. To access the site, go to www.gcsepod.com and click Login
2. Click "New To GCSEPod? Get Started!" and select "Student"
3. Enter your name, date of birth and type in the name of your school. The school's name should appear in the dropdown menu. Click to confirm.

All accounts are linked to your school email address.

If you have forgotten your password, just click reset password.

Any issues, you can email Miss Barnett, barnettv@wh-at.net to help you log on.

Year 8 - Knowledge Organiser: Crime (Part 1)	
Section 1: Historical Context	Section 3: Keywords and Definitions
<u>The 1800s</u>: Although crime stories began to appear in the late 1700s, the crime novel as we know it today first emerged with Edgar Allan Poe’s ‘The Murders in the Rue Morgue’ in 1841. This story led the reader through a series of clues so they could solve alongside the detective. Penny Dreadfuls were also popular during this period; published in weekly instalments, these stories sensationalised crime and criminals. <u>Late Victorian</u>: In 1887, the first Sherlock Holmes story was published. In total, Arthur Conan Doyle wrote four novels and over fifty short stories about the famous detective and his sidekick, John Watson. Sherlock’s impressive skills as a detective were exactly what a late Victorian audience wanted to read . At this time, crime was on the rise and the police force were considered inept (not very good). <u>The Golden Age</u>: The 1920s-1940s are considered the ‘Golden Age’ of fiction, with the crime genre being the most popular amongst readers. This age was dominated by the writer, Agatha Christie (and her most well-known detectives, Hercule Poirot and Miss Marple) and gave rise to writers such as Dorothy L. Sayers and Margery Allingham. Many of these books were set in closed communities and featured a ‘whodunnit’ element that readers could join in with. The popularity of the crime genre at this time also led to the creation of the well-known board game, Cluedo. <u>Hardboiled Crime</u>: The American reaction to the ‘cosy crimes’ of the British ‘Golden Age’ novels was the creation of ‘hardboiled’ crime in the 1940s – a lone detective, a gritty city setting – Raymond Chandler and Dashiell Hammett were key writers in this sub-genre. <u>Modern Crime</u>: Writing is inspired by several of the styles that have come before – often with more focus on psychological aspects of crime, as well as police and legal proceedings. Writers such as Val McDermid and P.D. James have been prolific for decades, with newcomers such as Richard Osman keeping modern crime readers entertained too.	Protagonist - The main character. Antagonist - The opponent to the main character. Adversary - An opponent or enemy. Genre - A category of literature identified by form, content and style, e.g. fairytale, Arthurian romance. Justice - The quality of being fair and reasonable. Moral - Concerned with the principles of right and wrong behaviour. Morality - A sense of what is right and wrong. Deduction - To work something out through reasoning. Obfuscate - To be unclear or confusing. Remorseful - Full of regret. Red herrings - Misleading clues that might trick a detective or reader Sensationalise - To present information in an exaggerated and shocking way.
Section 2: Overview of the Genre	
The crime genre revolves around criminal acts, their investigation and the consequences. It often explores the nature of justice, morality and human behaviour through the lens of lawbreaking and its aftermath. Crime writing has been the best-selling genre globally frequently over the past 150 years, <i>but why?</i> ▪ A gripping plot ▪ Suspense and tension ▪ Intrigued by the ‘darker’ side of life ▪ An element of puzzle-solving for the reader ▪ A clear resolution, where balance is restored	

Section 4: Convention of Genre	Section 5: Writer's Methods	Section 6: Big Ideas	
▪ <u>Detective</u> - They might be a professional police detective, a private detective or an amateur, 'armchair' detective. ▪ <u>Criminal and crime</u> - In modern texts, murder is the most common crime, whereas in the 'Golden Age', crimes often included theft or blackmail. Criminals' motives have changed too – in the past, motives have been based on revenge or for financial gain; modern texts often look at psychological factors. ▪ <u>Victims</u> - Changed over the course of the years too; in the 19th and early 20th century, victims were often male characters who had 'earned' the crime against them; modern texts use a more diverse cast of victims. ▪ <u>Clues and red herrings</u> - Writers will use both to help and mislead the detective and reader in solving the case. ▪ <u>Plot twists</u> – Unexpected plot moments will keep the story tense and unpredictable. ▪ <u>Themes</u> - Love, money, danger and death. ▪ <u>Setting</u> - Isolated, rural settings and busy cities are both common settings in crime fiction. ▪ <u>Resolution</u> - We expect a resolution: the crime to be solved and a punishment for the criminal.	<u>Structure</u> 1. Chronological structure - A story told in time order. 2. Climax - A moment of high drama or revelation in a story. 3. Resolution - The end of the narrative; the conclusion of a story's plot. 4. Flashbacks/forwards - When a story jumps backward or forward in time, interrupting the narrative. 5. Shifts in time and place. 6. Suspense - Creates a feeling of intense anticipation, uncertainty, or anxiety about what will happen next. <u>Narrative Viewpoint</u> 7. First person narrative - A mode of storytelling in which a storyteller recounts events from their own point of view using the first person such as 'I', 'me', 'us' etc. 8. Third person omniscient narrative - Story told by a narrator, but reveals the thoughts and feelings of one or more characters – '<i>John often wondered why...</i>' 9. Third person objective narrative - Story told by a narrator with a more detached or limited view – '<i>John walked down the street, looking thoughtful...</i>' 10. Unreliable narrator - A first person narrator who cannot be trusted – they might deceive or withhold information from the reader or give contradictory information. <u>Characterisation</u> 11. Characters' physical appearance 12. Characters' actions and dialogue 13. Characters' thoughts and feelings 14. Characters' relationships	<u>Comment on Society</u> Writers often use crime to express their concern about the state of society – <i>How can we solve crime? Are people truly evil? Why do people commit crime? Do victims always deserve our sympathy?</i> 	<u>Justice</u> In crime, the reader is invited to consider what is meant by justice – <i>what punishment might fit the crime committed?</i> 
		<u>Guilt, Remorse and Forgiveness</u> Crime writers often use guilt – or the lack of it – to create their criminals. <i>Does a criminal's lack of remorse make them more hateful?</i> 	<u>Morality</u> Crime writing makes us consider what morality means – <i>what morals do we hold dear? Are 'small' crimes okay? Can crime ever be justified?</i> 

Knowledge Organiser

Phase 1



Mathematics Department

Key

Units are colour coded by topic:

Algebra

Number

Shape

Ratio and Proportion

Data

Probability

Numeracy

Types of Numbers

Integer: Whole numbers (no digits after the decimal place).

Even: Number in the 2 times table.

2 4 6 8 10 12 14 16 18 20 22 ...

Odd: Numbers not in the 2 times table.

1 3 5 7 9 11 13 15 17 19 21 23 ...

Fractions: Fractions are numbers written in the form of division.

$\frac{2}{3}$ ← Numerator
← Denominator

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Calculations

Place Value

Th	H	T	U	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$

When you multiply by 10 you shift the digits 1 place value bigger. When you divide by 10 you shift the digits 1 place smaller.

Multiplication

There are lots of methods for multiplication but we recommend the column method.

$$\begin{array}{r} 421 \\ 63 \times \\ \hline 1'263 \\ 2'5'260 + \\ \hline 265'23 \end{array}$$

Addition & Subtraction

For addition and subtraction we use the column method. Remember to line up the place values in columns and start with the digit on the right first.

$$\begin{array}{r} 1253 \\ 42 + \\ \hline 1295 \end{array} \quad \begin{array}{r} 12848 \\ 162 - \\ \hline 1186 \end{array}$$

Division

For division we use the bus stop method.

$$\begin{array}{r} 7215 \div 5 \\ \hline 1443 \\ 5 \overline{) 7215} \\ \underline{5} \\ 22 \\ \underline{20} \\ 21 \\ \underline{20} \\ 15 \\ \underline{15} \\ 0 \end{array} = 1443$$

Time



The **small hand** points to the hour.

The **big hand** points to the minutes.

am means in the morning.

pm means in the afternoon.

There are 60 seconds in a minute.

There are 60 minutes in an hour.

There are 24 hours in a day.

There are 7 days in a week.

There are 52 weeks in a year.

There are 12 months in a year.

1 Mathematical Instruments

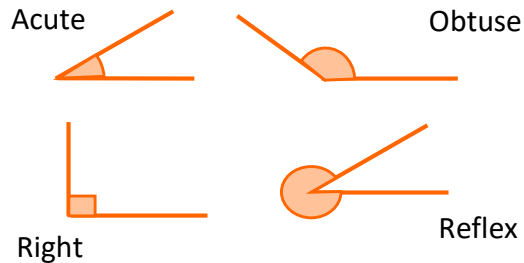


Compass: Used to draw arcs and circles.



Protractor: Used to measure and draw angles.

Types of Angle



Tally Chart

Colour	Tally	Frequency
Red		3
Blue		6
Yellow		2

Each dash represents 1 person

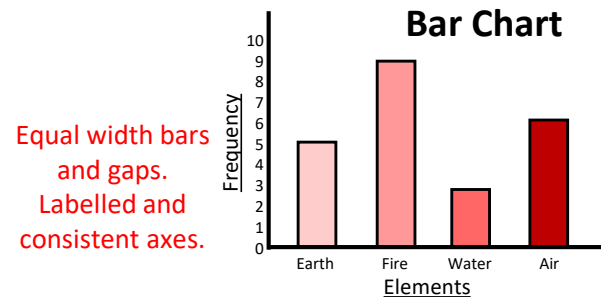
2 Bar Charts and Pie Charts

Pictogram

Shape	Frequency
Circle	○ ○ ○
Square	○ ○ ○ ○ ○
Triangle	○ ▽

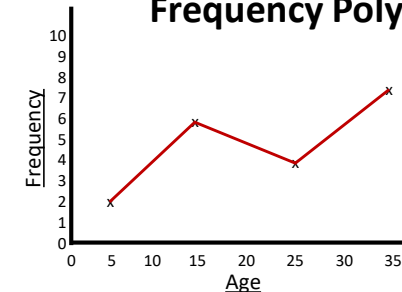
Key: ○ = 4 people

Bar Chart



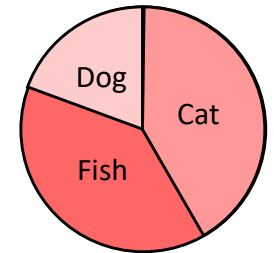
Equal width bars and gaps.
Labelled and consistent axes.

Frequency Polygon



Points plotted in the middle of each interval. Joined dot to dot.

Pie Chart



Angles must add to 360°

Frequency: The number of people/ objects in that category.

3 Factors and Multiples

Factor: A number which divides exactly.

Multiple: A number in its times table.

Highest Common Factor

The largest...
... of both numbers.
... divisor...

Lowest Common Multiple

The smallest...
... number in both...
... times tables.

Prime Numbers: 2 3 5 7 11 13 17 19 23 27 29 31 37 41 ...
Numbers which have exactly 2 factors. 1 is not a prime number.

Negative Numbers:

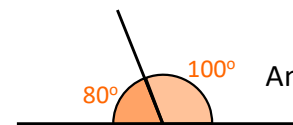
Adding and Subtracting

+ - same as -
- - same as +

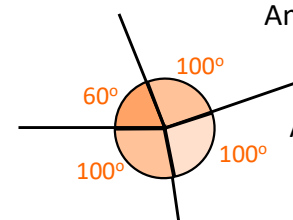
Multiplying and Dividing

- and - gives +
- and + gives -

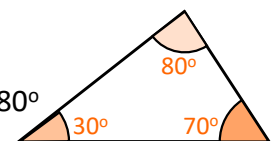
4 Angles Lines and Triangles



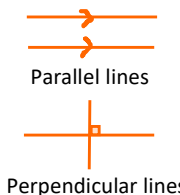
Angles on a straight Line add up to 180°



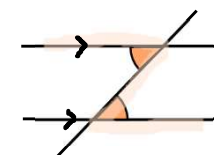
Angles in a triangle add up to 180°



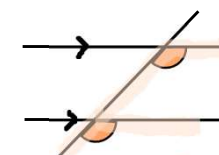
Angles around a point add up to 360°



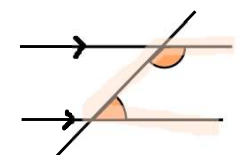
Parallel lines
Perpendicular lines



Alternate angles are equal



Corresponding angles are equal



Co-Interior angles add to 180°

5 Using Powers

Indices: Repeated multiplication.

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

'3 to the power of 5'

Square Root: The inverse of squaring a number. E.g. $\sqrt{25} = 5$ because 5^2 is 25.



Base	b^2	b^3	b^4	b^5
2	4	8	16	32
3	9	27	81	243
5	25	125	625	3125
10	100	1000	10000	100000

6 Simplifying Expressions

Expression: A collection of algebraic terms added or subtracted. E.g. $3a + 4b$

$$3 \times a = 3a \quad a \div 3 = \frac{a}{3}$$

When adding terms, we collect like terms.

$$a + a + a = 3a$$

When multiplying terms we use powers.

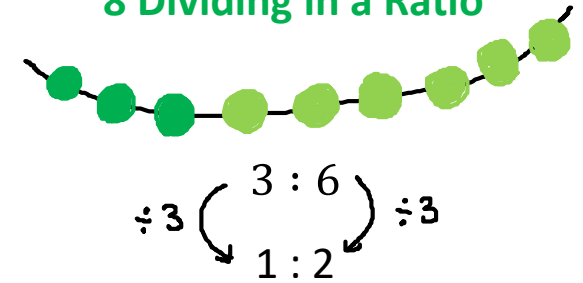
$$a \times a \times a = a^3$$

Expand: Multiply out the bracket

$$2(a + 3) = 2a + 6$$

Factorise: Put back into a bracket.

8 Dividing in a Ratio



'There are 2 light beads for every dark bead'

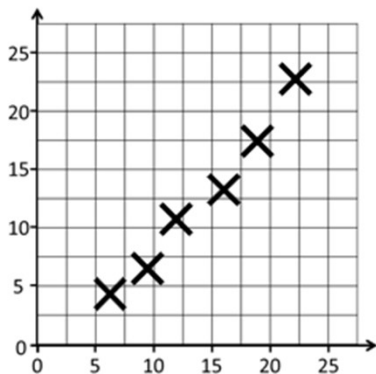
Sharing into ratio is the same as dividing into equal parts.

e.g. Share 12 into the ratio 1 : 3

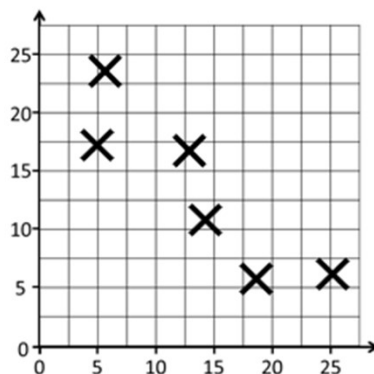
3	3	3	3
12			

= 3 : 9

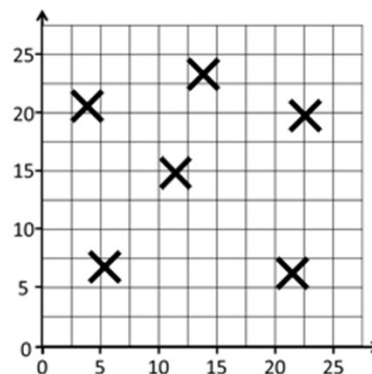
7 Scatter Diagrams



Positive Correlation



Negative Correlation



No Correlation

Line of Best Fit: A straight line which follows the trend of data.

Outlier: A data value which does not fit with the trend.

10 Decimal Places & Significant Figures

Integer: Whole numbers.

Decimal Places: The number of digits after the decimal point.

12.3456

- 12 to the nearest integer
- 12.3 to 1 decimal place
- 12.35 to 2 decimal places

Significant Figure: The first non-zero digit.

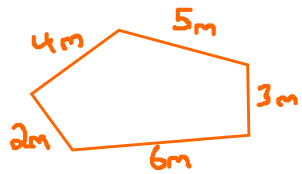
1234.56

- 1000 to 1 significant figure
- 1200 to 2 significant figures
- 1230 to 3 significant figures

Estimation: Round numbers to 1 significant figures and then calculate.

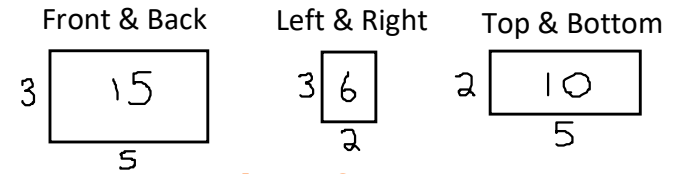
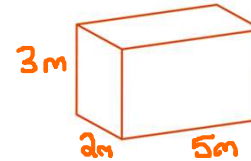
9 Area, Perimeter and Volume

Perimeter: The length around the edge of a shape.



Perimeter
 $4 + 5 + 3 + 6 + 2 = 20m$

Surface Area: The total area of all surfaces of a 3D shape.



Total Surface Area
 $15 + 15 + 6 + 6 + 10 + 10 = 62 m^2$

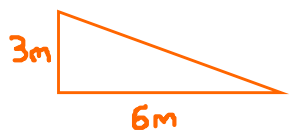
Area: The amount of space inside a 2D shape.

Area of a Rectangle = Length x Width



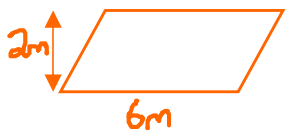
$Area = 4 \times 5 = 20 m^2$

Area of a Triangle = $\frac{1}{2} \times \text{Base} \times \text{Height}$



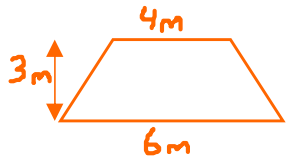
$Area = \frac{1}{2} \times 3 \times 6 = 9 m^2$

Area of a Parallelogram = Base x Perpendicular Height



$Area = 2 \times 6 = 12 m^2$

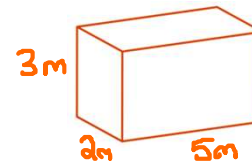
Area of a Trapezium = $\frac{1}{2} \times (\text{Sum of Parallel Sides}) \times \text{Height}$



$Area = \frac{1}{2} \times (4 + 6) \times 3 = 15 m^2$

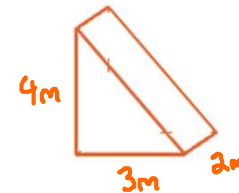
Volume: The amount of space inside a 3D shape.

Volume of a cuboid = Width x Depth x Height



$Volume = 5 \times 2 \times 3 = 30 m^3$

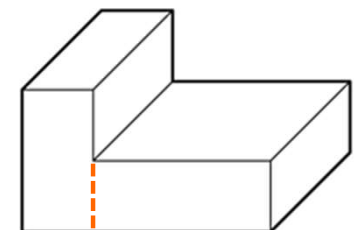
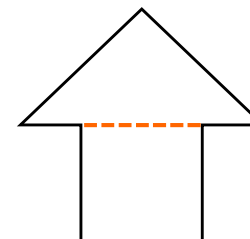
Volume of a Prism = Cross-Sectional Area x Depth



$Volume = \left(\frac{1}{2} \times 3 \times 4 \right) \times 2 = 12 m^3$

Compound Shape: A shape made up of two or more shapes.

To find the area or volume of a compound shape,
 break it up into shapes that you know.



11 Solving Equations

Inverse operations: The mathematical process which undoes a calculation.

Operation	Inverse
+	-
-	+
×	÷
÷	×
$__{}^2$	$\sqrt{__}$

Term: A collection of numbers and letters multiplied together. E.g. $4a$

Expression: A collection of terms added or subtracted. E.g. $3a + 4b$

Equation: A pair of expressions equal to each other. E.g. $2a + 5 = 4a$

12 Powers

Square Numbers: 1 4 9 16 25 36 ...

Numbers found by multiplying any number by itself.

Cube Numbers: 1 8 27 64 125 216 ...

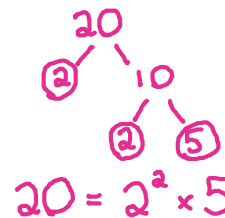
Numbers found by multiplying any number by itself twice.

Prime Numbers: 2 3 5 7 11 13 17 ...

Numbers which have exactly 2 factors. 1 is not a prime number.

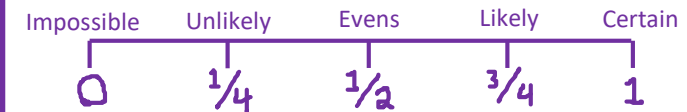
Prime factorisation: Write a number as a list of primes multiplied together.

To do this draw a prime factor tree, then multiply the primes together.



14 Probability

Probability: The chance or likelihood of an event happening.



$$\text{Probability} = \frac{\text{Desired outcomes}}{\text{Total possible outcomes}}$$

Mutually Exclusive: Two events which cannot happen at the same time.

Relative Frequency: Probability of an outcome given a number of trials.



An ordinary dice has numbers 1 to 6.



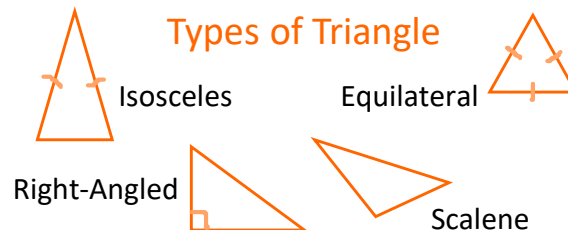
There are 52 playing cards in a pack.

16 BIDMAS

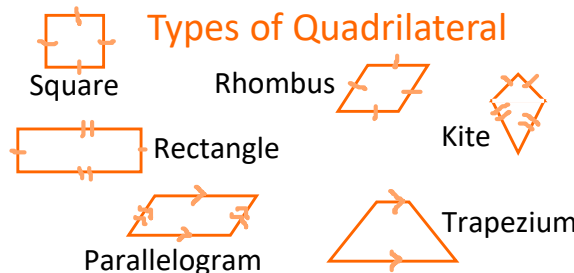
B Brackets	(5 + 5)
I Indices	5^2 5^3 $\sqrt{5}$
D Division	
M Multiplication	$\times$ $\div$
A Addition	$+$ $-$
S Subtraction	

Always use **BIDMAS**

Types of Triangle

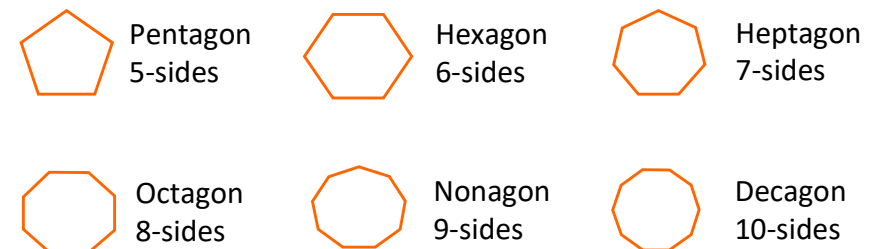


Types of Quadrilateral



15 2D Shape

Types of Polygon



Regular: All sides are equal length.

Compound Shape: Multiple shapes joined together.

17 Using Formulae

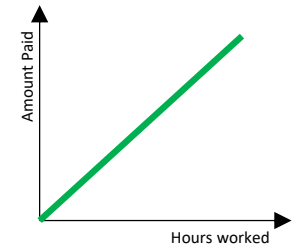
Equation: A pair of expressions equal to each other, such as $2a + 5 = 4a$

Formula: The connection between two or more quantities, such as $A = L \times W$

Every formula has a **subject** which is the letter that stands on its own. You may be asked to 'change the subject' by rearranging.

18 Everyday Proportion

Direct Proportion: Two quantities are in direct proportion if when one value increases so does the other. E.g. As the number of tickets increases, so does the price.



Ratios should not have units.

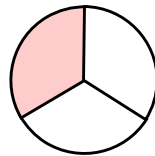
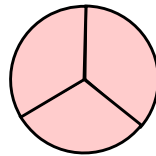
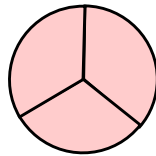
1cm : 3m should be written as 1 : 300

19 Fractions

A fraction is in its simplest form when the numerator and denominator are the smallest possible whole numbers.

$\frac{7}{3}$

Improper Fraction



$2\frac{1}{3}$

Mixed Number

Adding & Subtracting Fractions

1. Change any mixed numbers into improper fractions.
2. Use equivalent fractions to make the denominators the same.
3. Add/subtract the numerators, keep the same denominator.

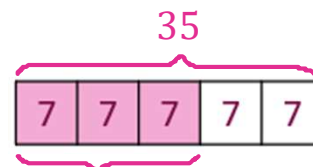
Multiplying & Dividing Fractions

1. Change any mixed numbers into improper fractions.
2. If dividing: **Keep** the first fraction the same. **Change** the divide to a multiply. **Flip** the second fraction over.
3. Then multiply the numerators and denominators separately.

Fraction of Amount

Use bar models to find fractions of amounts easily. E.g.

$\frac{3}{5}$ of 35



= 21

Remember to always simplify your answers!

20 Compound Units

1m = 100cm

1cm = 10mm

1g = 1000mg

1L = 1000ml

1kg = 1000g

1km = 1000m

1ml = 1cm³

Compound Unit: Compound units are those made up of more than one unit. For example: **kilometres per hour** links a unit for distance with a unit for time.

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

Speed is often measured in miles per hour (mph) or metres per second (m/s). Think: 'What distance is travelled in 1 hour or 1 second?'

21 Averages

The **average** of a set of data is a single value which best represents the whole set of data.

Mode: Find the number(s) that occurs the most times in the list of data.

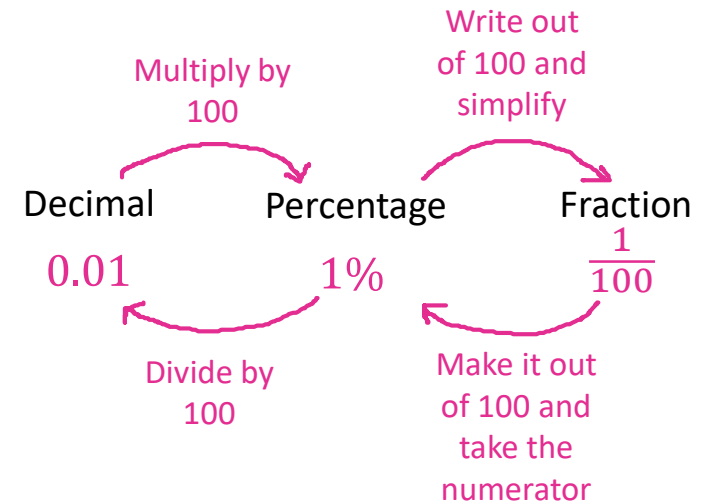
Median: Put the data in order from smallest to largest. Then find the middle number.

Range: Calculate the difference between the highest and lowest numbers in a set of data.

Mean: Add all the numbers together and divide by how many pieces of data there are.

To compare two sets of data it is important to compare values and spread.
E.g. compare the mean and the range.

22 Fractions, Decimals and Percentages



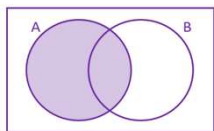
23 Sample Spaces

Sample Space: A table used to show all possible outcomes of two events. For example, the outcomes of rolling two ordinary dice and adding the score can be shown like this:

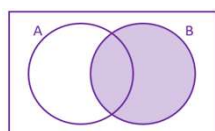
		Dice 1					
Dice 2	+	1	2	3	4	5	6
	1	2	3	4	5	6	7
	2	3	4	5	6	7	8
	3	4	5	6	7	8	9
	4	5	6	7	8	9	10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	12

Venn Diagram

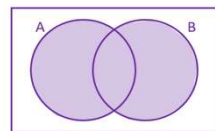
Venn Diagrams can be used to show the relationship between 2 or more characteristics.



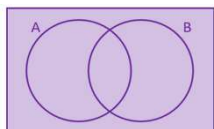
Values in A



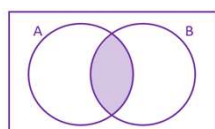
Values in B



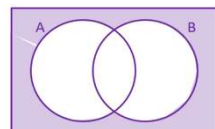
Values in A or B



All Values



Values in A and B



Values not in A or B

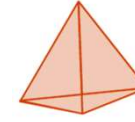
24 3D Shape



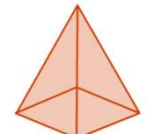
Cone



Sphere

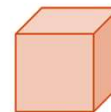


Triangular-Based Pyramid



Square-Based Pyramid

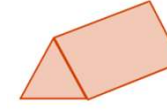
Prism: A 3D shape where 2 ends are identical shapes.



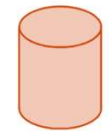
Cube



Cuboid

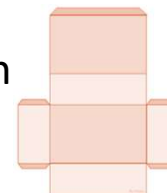


Triangular Prism



Cylinder

Net: A flat 2D shape which can be folded into a 3D shape.



Faces: The flat surfaces of the shape.

Edges: Lines where two faces meet.

Vertices: The points where edges meet.

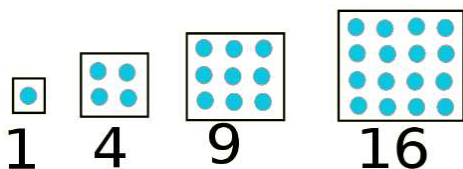
25 Sequences

A **sequence** is a list of things (pictures, numbers, words) which have a reasoning behind the order and the next can be predicted.

Arithmetic sequences: Add or Subtract the same amount each term.

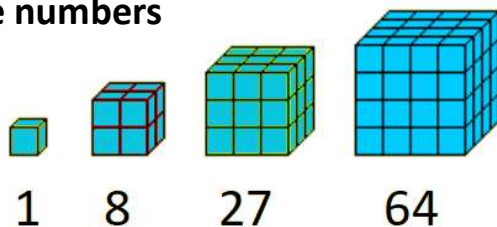
Geometric Sequences: Multiply or Divide by the same amount each term.

Square numbers



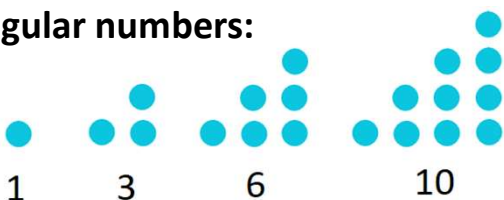
Generated by squaring the position of the term.

Cube numbers



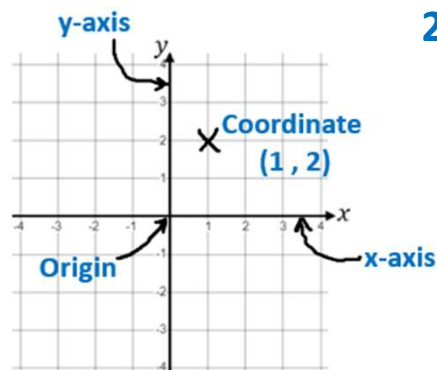
Generated by cubing the position of the term.

Triangular numbers:

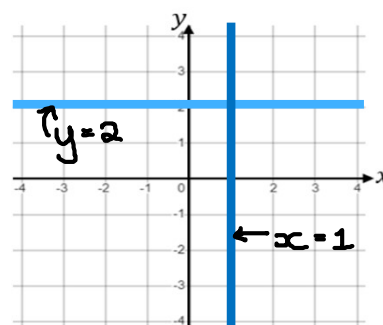


Generated by increasing the difference by 1 each time.

29 Drawing Graphs



'Along the corridor, then up the stairs'



Equations $y = \text{constant}$ form horizontal lines.
Equations $x = \text{constant}$ form vertical lines.

How to plot the line $y = 2x + 1$

x	y
-1	-1
0	1
1	3
2	5
3	7

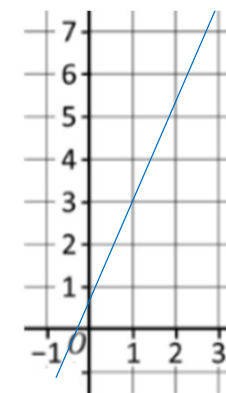
Substitute a range of x values into the equation to generate coordinates.

e.g. $y = 2 \times 1 + 1 = 3$

Tip: Start with the positive numbers first!

Then plot each pair of x and y values as a coordinate (x,y).

Join the points up with a straight line.



27 Percentage Change

Inequality Symbols

$a < b$ a is less than b

$a \leq b$ a is less than or equal to b

$a > b$ a is greater than b

$a \geq b$ a is greater than or equal to b

$a = b$ a is equal to b

$a \neq b$ a is not equal to b

Increase by 15%

Non-Calculator: Find 15% and add it to the original.

Calculator: $100\% + 15\% = 115\%$ so multiply the original by 1.15.

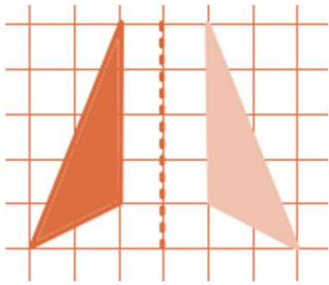
Decrease by 15%

Non-Calculator: Find 15% and subtract it from the original.

Calculator: $100\% - 15\% = 85\%$ so multiply the original by 0.85.

28 Transformations

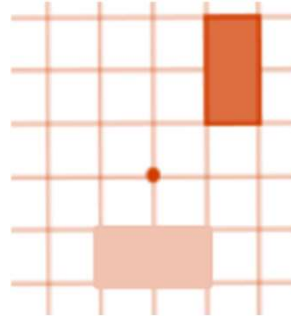
Reflection



To reflect a shape in a line:

1. Count the distance of each vertex from the mirror line.
2. The reflected shape will be the same distance in the opposite direction.

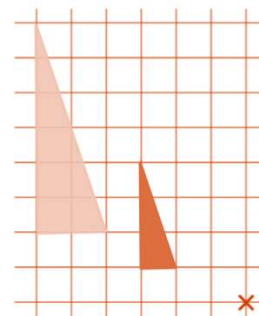
Rotation



To rotate a shape about a point:

1. Copy the shape onto tracing paper.
2. Hold your pencil on the centre point.
3. Turn the tracing paper the required degrees.

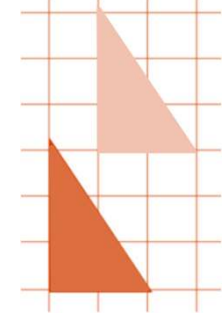
Enlargement



To enlarge a shape from a point:

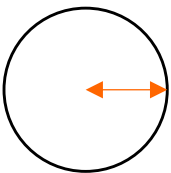
1. Count the distance across and up/down from the point to each vertex.
2. Multiply by the scale factor.
3. Start at the point and count the new distances.

Translation

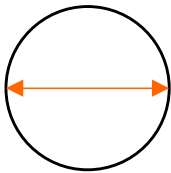


To translate a shape by $\begin{pmatrix} 1 \\ 3 \end{pmatrix}$ a column vector:
The top number is how far left/right to shift the shape.
The bottom number is how far up/down to shift the shape.

30 Area and Perimeter of Circles



Radius: The length from the centre to the circumference.



Diameter: The length joining two points on the circumference through the centre.



Circumference: The perimeter/ length around the edge of a circle.

$$\text{Area} = \pi r^2 = \pi \times \text{radius}^2$$

$$\text{Circumference} = \pi d = \pi \times \text{diameter}$$

31 Standard Form with a Calculator

A number in **standard form**:

$$a \times 10^b$$

a must be a number between 1 and 10.

b must be an integer. The power can be determined by how many places **a** has shifted from the units column to its position.

For example:

Ordinary Number		Standard Form
10000	=	1×10^4
11000	=	1.1×10^4
0.0001	=	1×10^{-4}

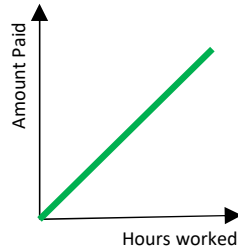
On your calculators look for this button



32 Proportion in Context

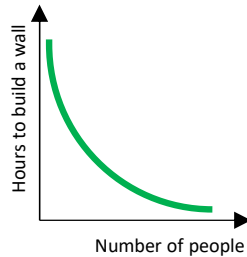
Direct Proportion:

Two quantities are in direct proportion if when one value increases so does the other.

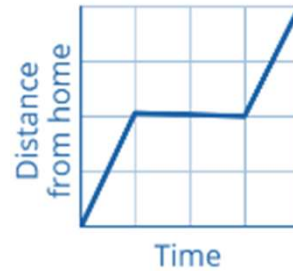


Inverse Proportion:

Two quantities are in inverse proportion if when one value increases the other decreases.



33 Graphs in Context



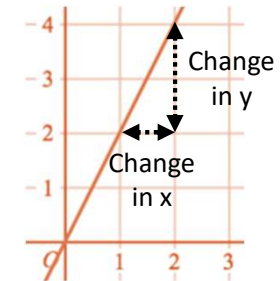
Distance-Time Graphs

Horizontal lines show the object is **stationary**/ not moving.

The steepness of the line shows the **speed** of the object is moving, the steeper the line. The faster the object is moving.

35 Gradient of a Line

Gradient is a measure of steepness of a line. To calculate the gradient:



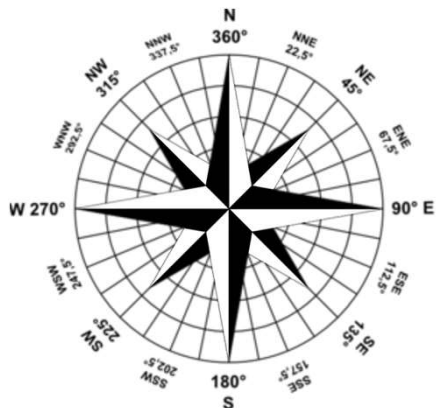
1. Choose two accurate points on the line.
2. Find the change in y and the change in x.
3. Then use the formula:

$$\text{Gradient} = \frac{\text{Change in } y}{\text{Change in } x}$$

34 Scale Factors and Similarity

Two shapes are **congruent** to one another, if they are exactly the same shape and exactly the same size.

Two shapes are **similar** to one another, if they one shape is an enlargement of the other.



Bearings are angles used to give directions with 3 rules:

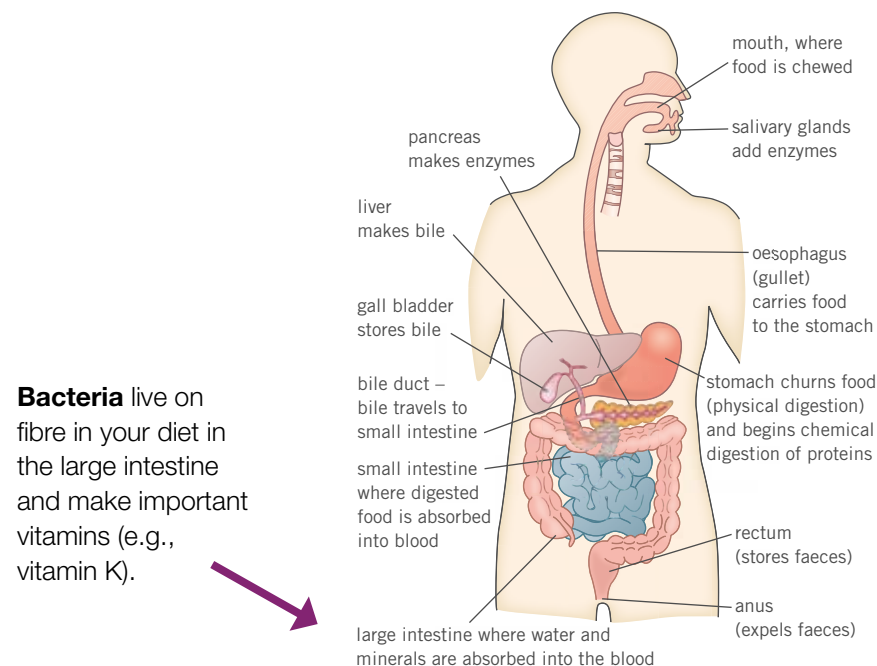
- Measured Clockwise
- Start from North
- 3-digits

In a pair of similar shapes the **scale factor** (SF) is how many times bigger one shape is than the other.

2cm	Length x SF	4cm
4cm ² 2cm	Area x SF ²	16cm ² 4cm
8cm ³ 2cm	Volume x SF ³	64cm ³ 4cm

Diet

The digestive system



Enzymes

Enzymes are special proteins that can break large molecules of nutrients down into small molecules.

Enzymes are known as biological **catalysts** – they speed up **digestion** without being used up.

There are three main types of enzyme involved in digestion:

	Type of enzyme		
	carbohydrase	protease	lipase
digests	carbohydrates (e.g., starch)	protein	lipids
	sugars	amino acids	fatty acids and glycerol

Nutrients

Nutrient	Role in your body
carbohydrates	main source of energy
lipids	fats and oils provide energy
proteins	growth and repair of cells and tissues
vitamins and minerals	essential in small amounts to keep you healthy
water	needed in all cells and body fluids
fibre	provides bulk to food to keep it moving through the gut (not actually a nutrient)

Starch

Add a few drops of iodine solution to the food solution.
Result: If the solution turns blue-black, the food contains starch.

Lipids

Add a few drops of ethanol to the food solution, shake it, and leave for one minute. Then pour the ethanol into a test tube of water.
Result: If the solution turns cloudy, the food contains lipids.

Food tests

Sugar

Add a few drops of Benedict's solution and heat the solution in a water bath.
Result: If the solution turns orange-red, the food contains sugar.

Protein

Add a few drops of copper sulfate solution and sodium hydroxide solution.
Result: If the solution turns purple, the food contains protein.

Effects of an unhealthy diet

A **balanced diet** is when you have the right proportions of the food groups to keep you healthy.

Eating an unbalanced diet can lead you to be:

underweight

Increased risk of:

- poor immune system
- lack of energy
- lack of vitamins and minerals.

overweight

Increased risk of:

- heart disease
- stroke
- diabetes
- some cancers.

vitamin and mineral deficient

Vitamin A deficiency can lead to night blindness.
Vitamin D deficiency can lead to rickets.

Effects of lifestyle on health

Drugs

Drugs are any chemicals that affect the way your brain and body work.

Medical drugs	Recreational drugs
- used in medicine - benefit your health if used correctly - used to treat symptoms or cure illness - some have side effects examples include: painkillers, antibiotics, and cough mixture	- taken for enjoyment/to relax/stay awake - normally have no health benefits - many can be harmful - many are illegal examples include: alcohol, caffeine, heroine, cocaine, tobacco

Alcohol

Alcohol is a depressant because it slows down your body's reactions.

Drinking large amounts of alcohol over a long time can cause:

- stomach ulcers
- heart disease
- reduced fertility
- brain damage
- liver damage (cirrhosis)

Drinking during pregnancy increases the risk of:

- miscarriage
- stillbirth
- premature birth
- low birth weight babies
- Fetal Alcohol Syndrome (FAS)

Smoking

Cigarette smoke is full of harmful chemicals including:

tar – clogs the lining of the lungs and alveoli, contains cancer-causing chemicals

nicotine – an addictive stimulant

carbon monoxide – stops blood from carrying oxygen.

Smoking can cause many different diseases, including:

- heart disease
- emphysema
- respiratory infections
- strokes
- lung cancer

Smoking during pregnancy increases the risk of miscarriage and low birth weight babies, and can also affect the fetus' development.

Addiction – When your body becomes used to the chemical changes caused by a drug and you need to take the drug to feel normal.

When a person who is addicted to a drug tries to stop taking it, they may suffer from sickness, nausea, stomach cramps, headaches, anxiety, and sweating. These are called **withdrawal symptoms**.



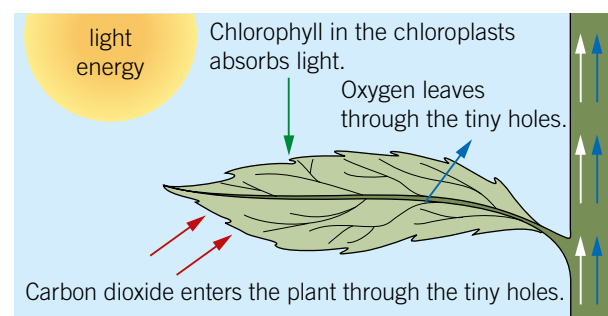
Key terms

Make sure you can write definitions for these key terms.

addiction anus balanced diet carbohydrase carbohydrate carbon monoxide catalyst deficiency digestion digestive system drug enzyme fibre food test large intestine lipid lipase mineral nicotine nutrient oesophagus protease protein rectum small intestine stimulant stomach tar vitamin withdrawal symptom

Photosynthesis

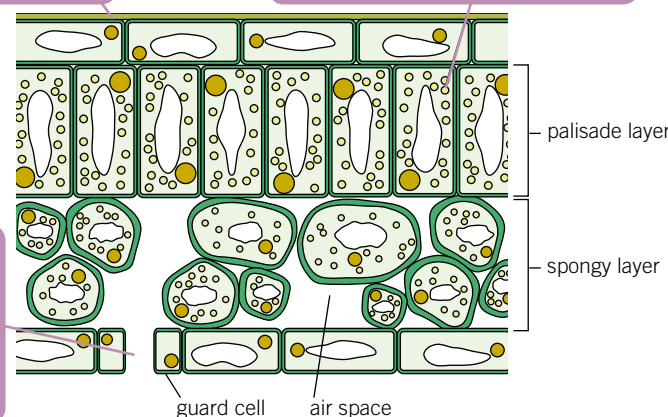
Photosynthesis is a chemical reaction that takes place in the **chloroplasts** to produce **glucose**.



waxy layer – to reduce water loss by evaporation

chloroplasts – mainly located on the upper side of the leaf where the most sunlight reaches

stomata – on the lower surface to reduce water loss by evaporation



Leaves are specially adapted for photosynthesis:

- have lots of green **chlorophyll** – absorb sunlight for photosynthesis
- are thin – allow gases to diffuse in and out of the leaf
- have a large surface area – absorb as much light as possible
- have veins – xylem and phloem transport water and glucose

The minerals plants need for growth are:

- 1 **nitrates** for growth
- 2 **phosphates** for healthy roots
- 3 potassium for healthy leaves and flowers
- 4 magnesium for making chlorophyll

If a plant does not have enough of a mineral, it may suffer from a mineral **deficiency**. Farmers can use **fertilisers** to add missing minerals to the soil.

Food chains and webs

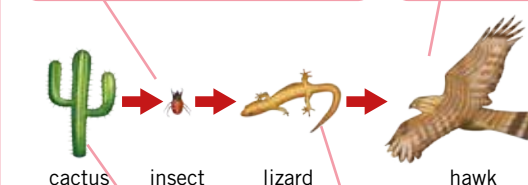
Food chains show the transfer of energy between organisms – the arrows represent the direction of energy transfer.

Food webs show how lots of food chains are connected in an ecosystem.

Food chain

herbivore – type of **consumer** that eats the producer

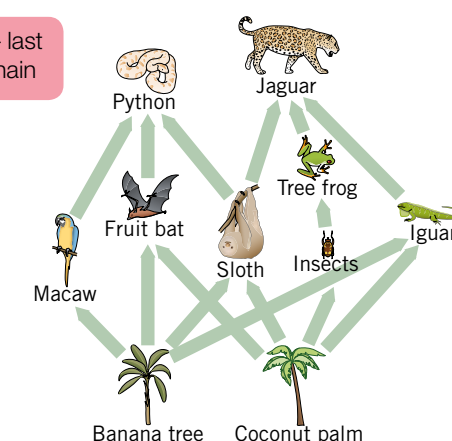
apex predator – last link in a food chain



producer – green plant/algae that makes its own food

carnivore – type of consumer that eats other animals

Food web



Prey: an organism eaten by another organism.

Predator: an organism that eats another organism.

Bioaccumulation is the build up of chemicals, like insecticides, passed along a food chain.

Respiration

with oxygen Aerobic respiration



- Respiration occurs in the **mitochondria** of cells to **transfer** energy.
- Glucose is absorbed from the small intestine into the blood **plasma**. It is transported to the cells where it diffuses in.
- Oxygen is breathed in and diffuses into the bloodstream. Oxygen is then carried by haemoglobin to the cells where it diffuses in.
- Carbon dioxide diffuses out of the cells into the blood plasma. It is transported to the lungs where it diffuses into the air sacs and is exhaled.

without oxygen

Anaerobic respiration (in animals)



- This occurs when there is not enough oxygen for aerobic respiration, such as during strenuous exercise.
- It transfers less energy than aerobic respiration.
- The lactic acid produced can cause muscle cramps. This causes increased inhalation to break down lactic acid – the oxygen needed is called the **oxygen debt**.

Fermentation (in microorganisms)



- Yeast respire anaerobically – this fermentation is important in food production (e.g., bread, beer, and wine).

Populations and ecosystems

The number of organisms that live in the same area is called a **population**. Populations of organisms are constantly changing – this affects other populations in a food web.

Interdependence is when living organisms depend on each other to survive, grow, and reproduce.

Ecosystem: all the organisms found in a particular location, and the area they live in.

Community: the organisms in an ecosystem. **Habitat**: the area a community lives in.

Niche: the particular place or role that an organism has within an ecosystem. This reduces competition for resources.

Chemosynthesis

Chemosynthesis is when bacteria use a variety of chemical reactions to make their own glucose. Chemosynthesis:

- uses chemicals as the source of energy
 - often uses carbon dioxide as a reactant
- For example, sulfur bacteria at the bottom of deep sea vents and nitrogen bacteria in the soil use chemosynthesis to produce glucose.



Key terms

Make sure you can write definitions for these key terms.

aerobic anaerobic bioaccumulation carnivore chemosynthesis chlorophyll community consumer deficiency ecosystem fermentation fertiliser food chain food web producer
habitat herbivore interdependence mitochondria niche nitrate oxygen debt plasma phosphate photosynthesis population predator prey stomata

Variation

Differences in characteristics are called **variation**.

Inherited variation

Characteristics are passed on from parents to offspring

genetic diseases
eye colour
blood group

Surroundings affects your characteristics

dyed hair
tattoos
accent

Environmental variation

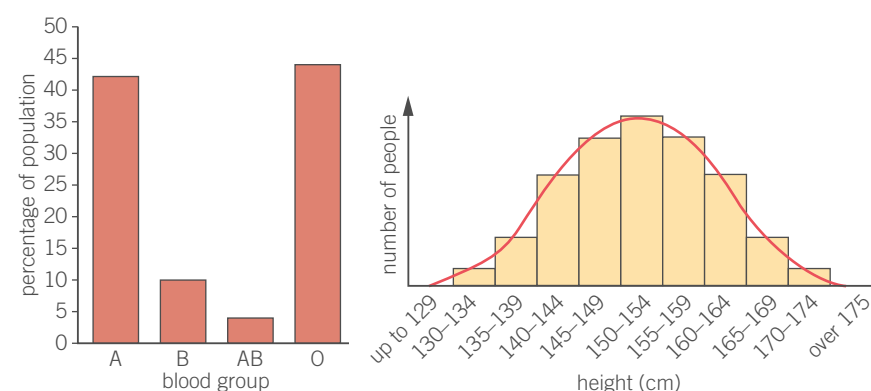
Many characteristics, such as height, are affected by both inherited and environmental variation.

Discontinuous variation

can only result in certain values (e.g., blood group or eye colour)

Continuous variation

can take any value within a range (e.g., height or hair length)



Discontinuous variation should be plotted on a bar chart, and continuous variation should be plotted on a histogram.

Inheritance

Characteristics

Characteristics are inherited from your parents through genetic material stored in the nucleus of cells.

We inherit half of our DNA (deoxyribonucleic acid) from our mother and half from our father.

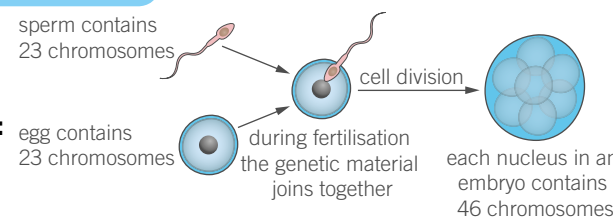


DNA

- contains all the information needed to make an organism
- is arranged into long strands called **chromosomes**.
- each chromosome is divided into sections of DNA
- sections of DNA that contain the information to produce a characteristic are called **genes**

Scientists Watson, Crick, Franklin, and Wilkins, worked together to produce a model of the structure of DNA.

Inheritance of genetic material:



Natural selection

Organisms in a species show variation caused by differences in their genes.

Process of natural selection

- All living organisms have **evolved** from a common ancestor, through the process of natural selection.
- Organisms change slowly over time.
- Those better adapted to their environment are more likely to survive.

Organisms with the most useful characteristics survive and reproduce.

This is called 'survival of the fittest'.

Successful genes are passed on to the offspring.

This is repeated many times and over a long time can lead to a new species.

Adaptation and change

Adaptation

- Adaptations are characteristics that help an organism to survive and reproduce.
- For example, the cheetah is the fastest land animal. This speed makes it a very successful predator.

Competition

Animals compete for: food, water space (for shelter and to hunt), and mates (to reproduce).
Plants compete for: light, water, space, and minerals (plants produce their own food through photosynthesis).

Environmental changes

- Plants and animals adapt to changes in their environments.
 - Habitats can change through fire, climate change, or disease causing reduced food supplies.
- For example, deciduous trees look different in each season, and bears hibernate somewhere warm in the winter.

Competition and adaption

- Predator and prey species are **interdependent**.
 - This occurs when a change in the population of one animal directly affects the population of the other.
- For example, the number of Canadian lynx and its prey the snowshoe hare.

Extinction

If a species is not well-adapted to its environment it will not survive, and the organisms will die before reproducing. A species becomes **extinct** when there are no more individuals of that species left anywhere in the world. The **fossil record** shows that many species that once lived have become extinct.

Factors leading to extinction:

- changes to the organism's environment
- destruction of their habitat
- new diseases
- new predators
- increased competition.

Scientists are trying to prevent **endangered** species (at risk of extinction) from becoming extinct. For example, by using gene banks to store genetic samples from different species. In the future these can be used for research, or to produce new individuals.



Key terms

Make sure you can write definitions for these key terms.

adaptation competition chromosome continuous characteristic discontinuous DNA inherited variation environmental variation evolution extinct fossil record gene gene bank interdependent natural selection species variation

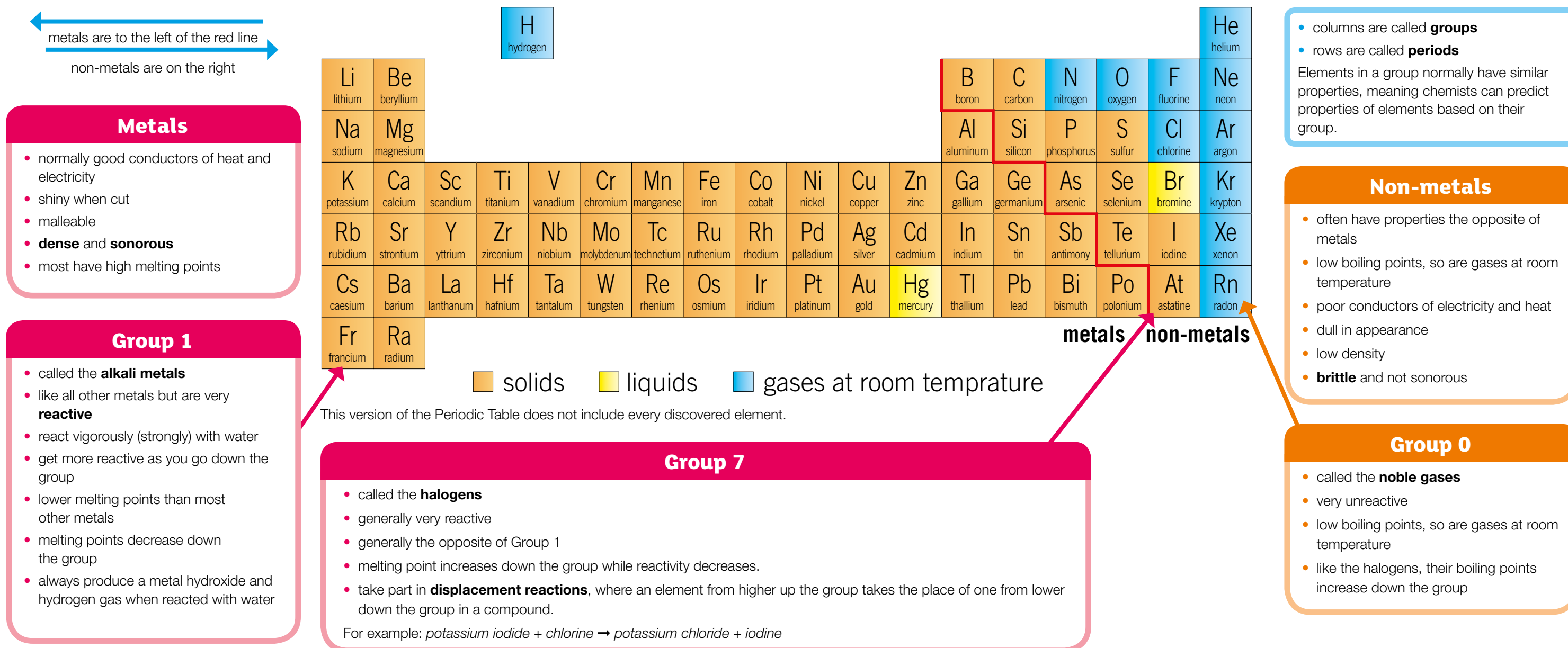
The **Periodic Table** displays the names and symbols of all the **elements** we have discovered which are organised by their **chemical properties** and their **physical properties**.

Physical properties

The **physical properties** of an element describe how a substance behaves generally.
(E.g., **conductor** of electricity, dense, conductor of heat, shiny, **malleable**, sonorous, high melting and boiling points)

Chemical properties

The **chemical properties** of an element describe how a substance behaves in terms of its chemical reactions. *For example, how reactive it is, what other substances it reacts with, and the products it forms in reactions.*



Key terms

Make sure you can write definitions for these key terms.

alkali metal	brittle	conductor	chemical property	dense	displacement reaction	element	group	halogen	malleable	metal	noble gas	non-metal
			period	Periodic Table	physical property	sonorous	reactive					

What are mixtures?

Mixtures are different substances found together, but not chemically bonded. This means the different substances can be **separated** from each other.

In a **compound**, different substances are chemically bonded together, while in a mixture they are not.

The substances that make up a mixture keep their own properties and are easy to separate.

You can change the amounts of the substances in a mixture.

You can tell the difference between a **pure substance** and an **impure substance** – a pure substance has a single, sharp melting point, while an impure substance (a mixture) has a range of temperatures for its melting point.

Solutions

Solutions are a type of mixture made of two parts:

1 Solvent: the liquid that makes up most of the solution.

2 Solute: the substance that is added to the solvent and **dissolves** into it.

The solute usually starts as a solid, and its particles break away from each other and move into the solvent.

Solubility

The **solubility** of a solute means how much solute can dissolve in a certain volume of solvent.

- Different solutes have different solubilities in different solvents.
- Increasing the temperature often increases the solubility.
- Soluble substances can dissolve, **insoluble** substances cannot.

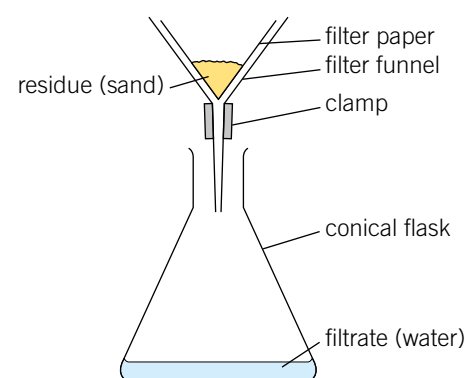
Saturated: when so much solute has been added to the solvent that no more can dissolve, we say the mixture is saturated.

How can we separate mixtures?

Filtration

A method to separate a mixture of an undissolved solid and a liquid.

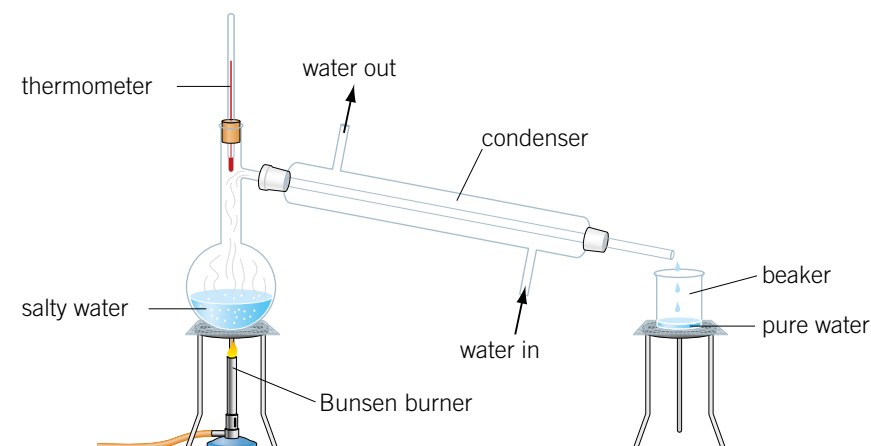
- 1 Filter paper** has extremely small holes in it.
 - Particles in a liquid or solution are so tiny that they can fit through the holes.
 - Larger particles of the solid are too big to fit through the holes and are held back by the paper.
- **Residue:** solids left behind in the filter paper.
 - **Filtrate:** the liquid that passes through the filter paper.



Distillation

A method that separates a solute and a solvent while keeping the solvent.

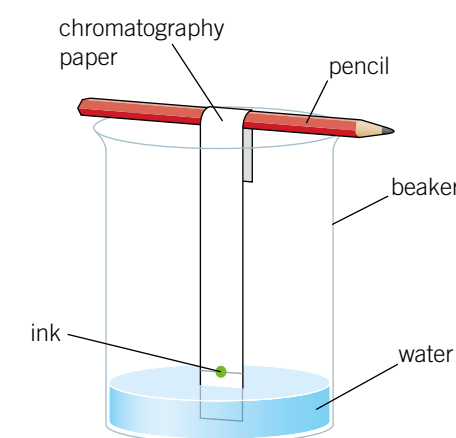
- The solution is boiled so the solvent turns into a gas.
- The gas is then cooled down in a **condenser**, where it turns back into a liquid and can be collected.



Chromatography

A method used to separate mixtures that are soluble in the same solvent.

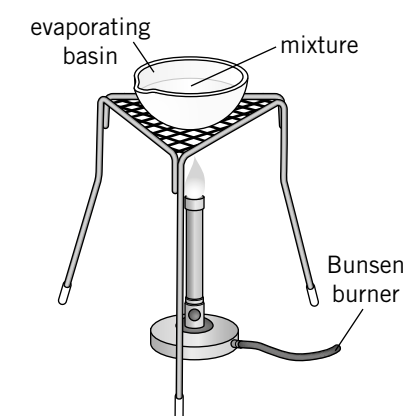
- A mixture like ink is placed on a piece of paper, which is placed in a solvent.
- As the solvent moves up the paper it separates all the different constituents (parts) of the ink, producing a **chromatogram**.



Evaporation

A method to separate a solute and a solvent, keeping the solute.

- The solution is heated then left in an evaporating basin until all the solvent evaporates.
- The solute is left behind as a solid.



Key terms

Make sure you can write definitions for these key terms.

chromatography chromatogram compound condenser dissolve distillation evaporation filtrate filtration filter paper impure substance insoluble mixture pure substance
 residue saturated separate solvent solute soluble solubility solution

Metals and acids

- If a metal reacts with an acid, it produces a **salt** and hydrogen gas.
- All acid compounds have hydrogen in them.
- When the hydrogen is replaced by a metal, the compound is called a salt.

For example, sulfuric acid has the formula H_2SO_4 . Copper sulfate has the formula CuSO_4 – it is a salt because the copper has taken the place of the hydrogen in sulfuric acid.

The three main acids are hydrochloric acid, sulfuric acid, and nitric acid.
 Metals can react with all of these acids to produce a salt and hydrogen gas.
 $\text{copper} + \text{hydrochloric acid} \rightarrow \text{copper chloride} + \text{hydrogen}$
 $\text{iron} + \text{sulfuric acid} \rightarrow \text{iron sulfate} + \text{hydrogen}$
 $\text{magnesium} + \text{nitric acid} \rightarrow \text{magnesium nitrate} + \text{hydrogen}$

Testing for hydrogen gas

The gas produced when reacting a metal and a salt can be collected in an upturned test tube, and a test performed to check that the gas is hydrogen.
 Insert a lit splint into the upturned test tube – if the gas is hydrogen, there will be a ‘pop’ sound.

Metals and water/steam

- Very reactive metals like sodium will react with cold water to produce a metal hydroxide and hydrogen gas.

$\text{sodium} + \text{water} \rightarrow \text{sodium hydroxide} + \text{hydrogen}$

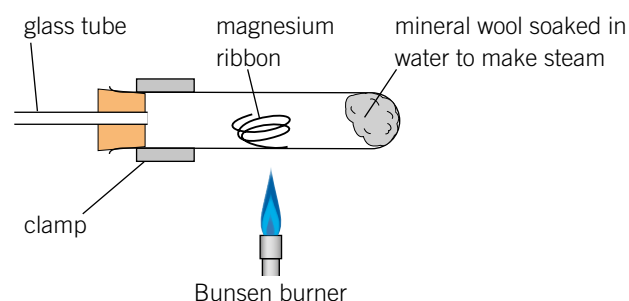


- Other metals like magnesium only react with steam, and produce a metal oxide and hydrogen.

$\text{magnesium} + \text{steam} \rightarrow \text{magnesium oxide} + \text{hydrogen}$



Magnesium can be reacted with steam using the following experimental set-up.



Metals and oxygen

- Many metals will react with oxygen from the air to produce a metal oxide.
- Often, they will need to be heated before they can react.

Metal	Reaction with oxygen
magnesium	burns vigorously
zinc	burns less vigorously
iron	burns
lead	do not burn; when heated, form layer of oxide on surface
copper	do not burn; when heated, form layer of oxide on surface
gold	no reaction

Metal displacement reactions

- A **displacement reaction** occurs when a more reactive element takes the place of a less reactive element in a compound.
- In metals, this means that the more reactive metal will become a compound, and the less reactive one an element.

For example, iron is more reactive than copper so:

The reactivity series

Increasing reactivity	most reactive
	potassium
	sodium
	lithium
	calcium
	magnesium
	aluminium
	zinc
	iron
	lead
	copper
silver	
gold	
least reactive	

State symbols

- Symbol equations have letters in brackets after each substance.
- These tell you the state of matter of each substance, and are called **state symbols**:

(s) = solid, (l) = liquid, (g) = gas, (aq) = dissolved in water

For example, $\text{H}_2\text{O}(s)$ is ice, $\text{H}_2\text{O}(l)$ is water, $\text{H}_2\text{O}(g)$ is steam, and $\text{NaCl}(aq)$ is sodium chloride (table salt) dissolved in water.

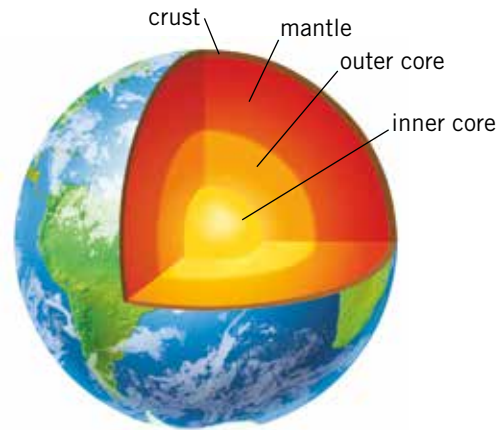


Key terms

Make sure you can write definitions for these key terms.

acid displacement reaction metal reaction reactivity reactivity series salt state symbol

The Earth

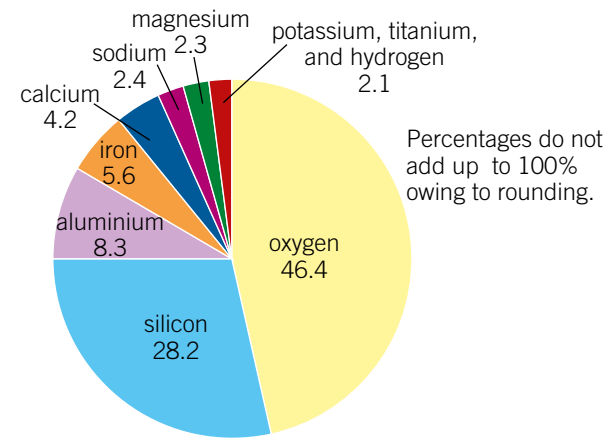


The Earth is made of several layers:

- The **crust** is rocky and solid.
- The **mantle** is solid rock but can flow.
- The **outer core** is liquid metal and the **inner core** is solid metal.

The crust

The Earth's crust contains many naturally-occurring elements in different proportions.

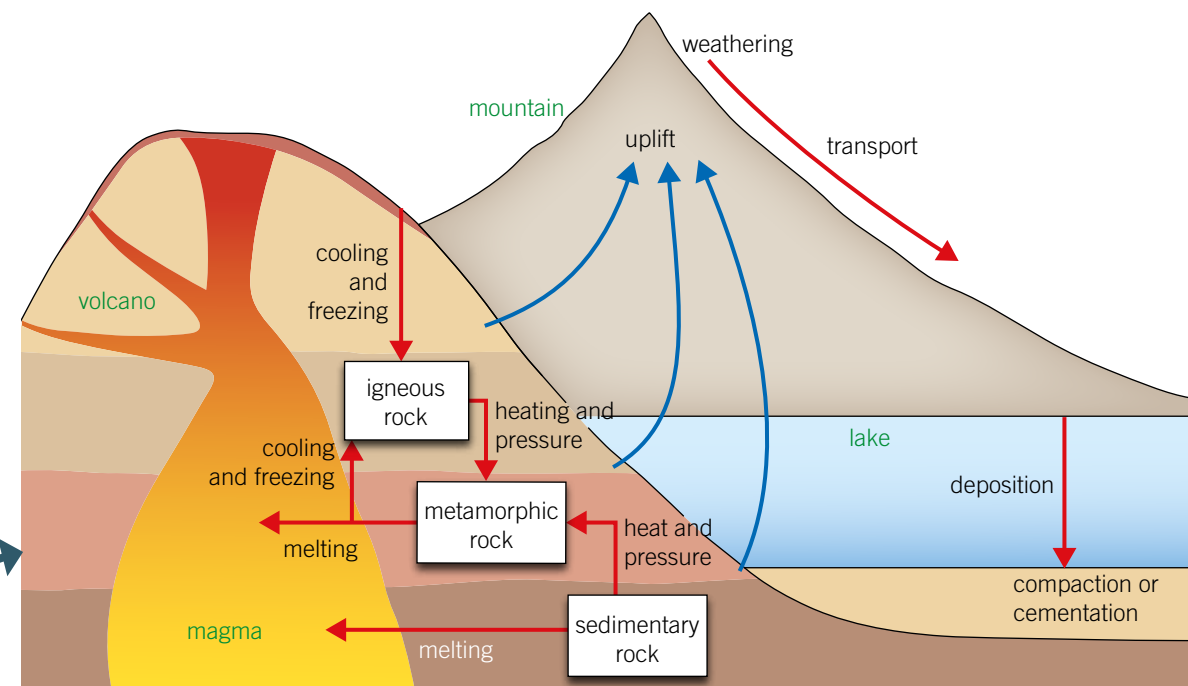
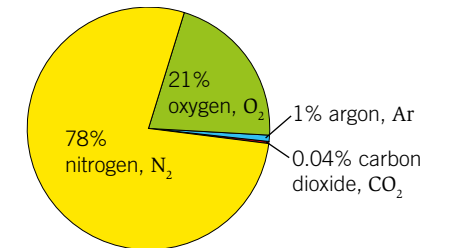


Types of rock

There are three types of rock that make up the Earth's crust. These are formed by different processes in the **rock cycle**, and have different properties.

The atmosphere

The **atmosphere** is a layer of gas surrounding the Earth. It is mainly comprised of nitrogen and oxygen.



The rock cycle

Because the different rocks can turn into each other, we say that there is a rock cycle.

Type of rock	How it is formed	Properties	Uses
sedimentary rock	• sediment piles up in one place and over many years stick together by compaction or cementation • compaction: weight of sediments above squeeze them into rocks • cementation: another substance sticks the sediments together	• porous: made of small grains stuck together so there are holes that water can pass through • soft: easy to break apart the sediments	building materials (e.g., sandstone and limestone)
igneous rock	• when liquid rock cools it turns into igneous rocks these are made of crystals locked tightly together • Magma: liquid rock underground – cools slowly and forms large crystals. • Lava: liquid rock above the ground – cools quickly and forms small crystals.	• Durable and hard (difficult to damage): the crystals are locked tightly together • Not porous: there is no space between crystals	pavement rail tracks
metamorphic rock	• other rocks under the Earth are heated and put under pressure • over time, these rocks become metamorphic	• Not porous: there is no space between crystals	marble used for kitchens slate used for roofing tiles



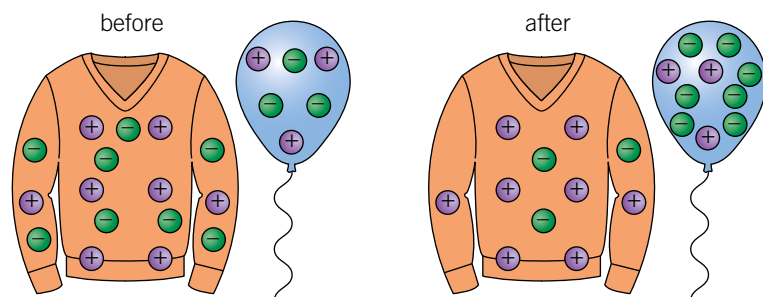
Key terms

Make sure you can write definitions for these key terms.

atmosphere crust cementation compaction Earth igneous rock inner core lava magma mantle metamorphic rock outer core porous rock cycle sedimentary rock

Charging up

Static electricity: by rubbing **insulators** together **electrons** are transferred, which gives the objects magnetic charges.



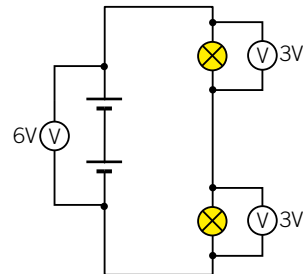
Like charges **repel**, and opposite charges **attract**.
Charged objects have **electric fields** around them.
These lines show how a positive charge will act.

Series and parallel circuits

In a series circuit all of the components are connected in one loop. If one component or wire breaks, **current** stops flowing everywhere.

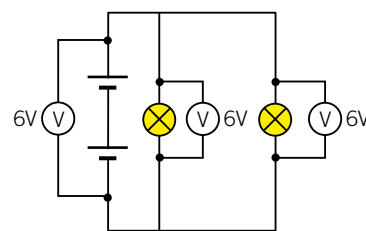
Series circuits

- contain only one loop
- the current is the same everywhere
- the **potential difference** across each component adds up to the potential difference across the battery



Parallel circuits

- contain multiple branches
- currents in all the branches add up to make the total current
- the potential difference across each component is the same as the potential difference across the battery



Resistance

The **resistance** is a measure of how easy it is to pass through a component.

conductors – low resistance

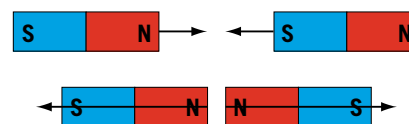
insulators – high resistance

Resistance is calculated by measuring the potential difference and the current.

The unit for resistance is the **ohm (Ω)**.

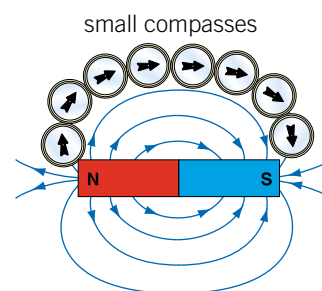
Magnets

- **Magnets** have north and south poles.
- Opposite poles attract, and the same poles repel:



Magnetic fields

- A magnet has a field around it.
- You can see the field around a bar magnet with a small compass or iron filings.
- If the lines are close together the field is stronger.



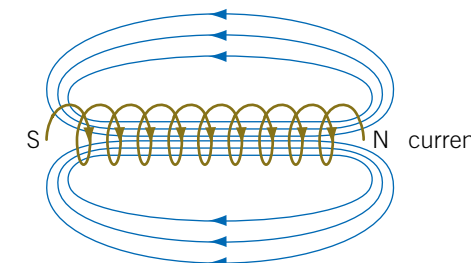
- The Earth has a magnetic field, which acts like a big bar magnet, with the south pole at the top of the planet.

Electromagnets

- **Electromagnets** are only magnetic when they have a flow of current, so they can be turned off.
- They are made by running a current through a coil of wire.
- They usually have an iron core in the middle of the coil, which makes them stronger.

You can make an electromagnet stronger by:

- adding more turns of wire on the coil
- using more current.



Uses of electromagnets

- moving cars or other metal objects
- sorting iron and steel from aluminium
- making motors and speakers
- making levitating trains, which travel much faster as there is no friction

How motors work

Applying a current to a coil of wire makes it electromagnetic.

This causes a force between the coil of wire and the permanent magnet nearby, driving a motor.

Potential difference

- Potential difference is the amount of energy transferred by the charges in the circuit.
- It is measured with a **voltmeter** (connected in parallel). The unit is the **volt (V)**.

Circuits and currents

- Current is the amount of charge flowing per second.
- It is measured with an **ammeter** (connected in series).
- The unit for current is the **amp (A)**.



Key terms

Make sure you can write definitions for these key terms.

ammeter attract conductor current electron electric field electromagnet insulator repel magnet magnetic field line motor north pole ohm parallel potential difference
resistance series static electricity south pole volt voltmeter

Energy adds up

The **law of conservation of energy** states that energy cannot be created or destroyed, only transferred.

$$\text{total energy before} = \text{total energy after}$$

Transferring energy

Light, sound, and electricity are ways of transferring energy between different stores.

Energy and temperature

- **Thermometers** measure temperature in degrees **Celsius (°C)**.
- Temperature measures the **average** energy.
- **Thermal energy** measures the **total** energy.

A warm bath has more thermal energy than a heated kettle, even though the kettle has a higher temperature.

Heating solids, liquids, and gases

- As we heat things the particles gain more **kinetic energy**, and vibrate more or faster.
- The energy needed to heat an object depends on the mass, material and temperature rise.

Equilibrium

Equilibrium is when objects have the same thermal energy.

Energy and power

Renewable resources

Renewable resources produce greenhouse gases when built, not when used, and will not run out.

For example, wind, tidal, wave, hydroelectric, geothermal, biomass, and solar powers.

The current created is sent to our offices, factories, and homes down long cables.

These fossil fuels produce **greenhouse gases**, such as carbon dioxide.

Fossil fuels are burned to heat water, which produces steam.

The steam turns a turbine, which spins a generator.

Non-renewable resources

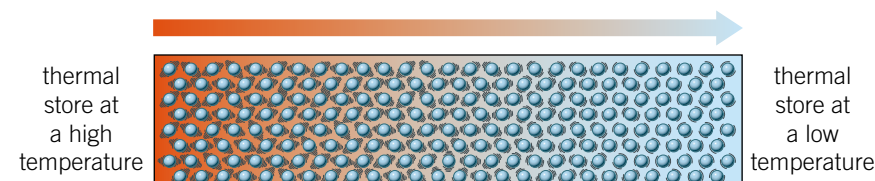
Non-renewable resources include the **fossil fuels** coal, oil, and gas. These were formed millions of years ago from fossilised remains. These are non-renewable because you cannot reuse them, and they will eventually run out. Coal, oil, or gas are used to run **thermal power stations**.

Particles

Thermal energy can be **transferred** by **conduction**, **convection** or **radiation**.

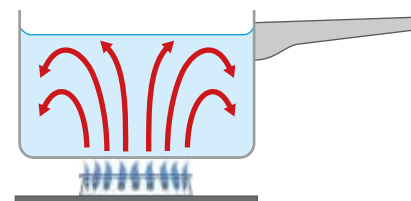
Conduction

- Particles collide into others when they vibrate.
- Occurs in solids.



Convection

- Occurs in liquids or gases.
- The part in contact with the heat source gets hotter. The particles move faster, causing them to become further apart, and a decrease in density.
- The hot part then rises, and cooler, denser parts fall and take its place at the bottom.
- They now heat, so the cycle continues. We call this a **convection current**.



Energy and power

Power is the rate of energy transfer – how much energy is transferred each second.

Energy bills

- Energy bills are measured in 1 **kilowatt** per hour (kWh).
For example, a 2kW device uses 4kWh.
- A bill covers the cost of the fuel used at the power station, the power station, staff, and infrastructure.
- To convert kWh this to joules, convert the time to seconds.
For example, $2000\text{J/s} \times 7200\text{s} = 14\,400\,000\text{J}$

Reducing bills

- Use fewer appliances or more efficient ones.
- Insulated houses lose less thermal energy so don't need to use as much power.

Work energy and machines

$$\text{Work done (J)} = \text{force (N)} \times \text{distance (m)}$$

Simple machines like **levers** and **gears** can make it easier to do work but you still get the energy out that you put in.

Radiation

- **Infrared radiation** transfers energy without particles – it is a wave.
- All objects emit radiation.
- The amount depends on their temperature and the surface (colour and rough/smooth).
- Radiation can be **absorbed** or **reflected**.

Food and fuels

- There is energy in the **chemical stores** associated with food and fuel.
- Energy is measured in **joules (J)**.
- You need different amounts of energy for different activities.

The energy in food varies.
For example:

- apple – 200kJ per 100g
- chips – 1000kJ per 100g

The energy used when we do things varies too.
For example:

- sitting – 6kJ per minute
- running – 60kJ per minute



Key terms

Make sure you can write definitions for these key terms.

absorb chemical store conduction convection convection current equilibrium fossil fuel gear greenhouse gas infrared radiation insulator joule kilowatt kinetic energy
law of conservation of energy lever non-renewable power station radiation renewable reflect thermal energy thermometer work

Speed

Speed is how far something moves in a certain time.

$$\text{speed (m/s)} = \frac{\text{distance travelled (m)}}{\text{time taken (s)}}$$

- Speed is measured in **metres per second (m/s)**.
- Convert distances to metres and times to seconds to get the answer.

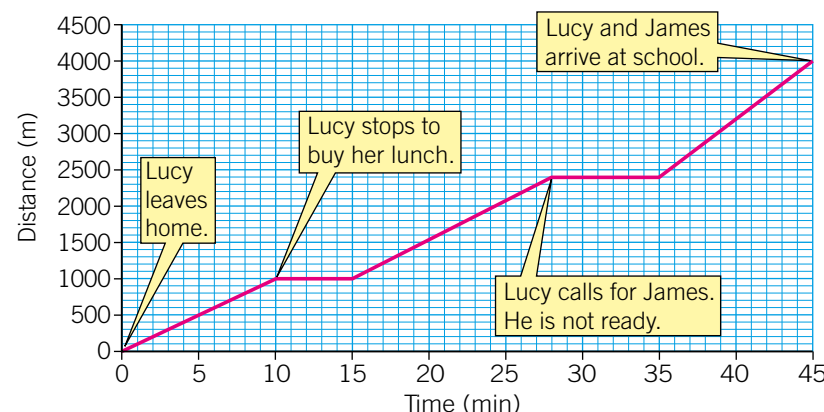
Relative motion

- Compares how fast one object is moving to another.
- If two objects are moving at the same speed in the same direction then their relative speed is zero.

Motion graphs

Distance-time graph

These graphs show the distance something travels over a certain time.

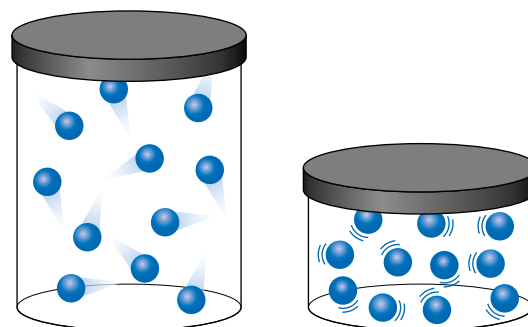


To calculate the average speed from a distance-time graph you find the distance covered, and divide it by the time taken.

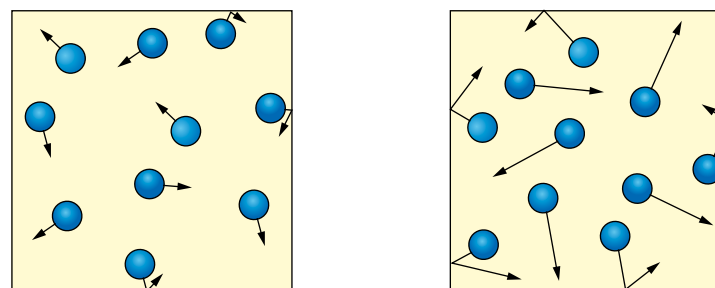
Pressure in gases

Collisions between gas molecules and their container produce **gas pressure**.

If you **compress** (squash) a gas into a smaller volume there will be more collisions, and so a higher pressure.



If you heat a gas, the particles will have more energy. This means they will move more quickly and collide with the container more often, so the pressure will be greater.



Atmospheric pressure is the pressure acting on us from the air around us.

- The higher above sea level the lower the atmosphere pressure.
- This is because the air is less dense the higher you go above sea level, so there are fewer collisions between air particles.

Turning forces

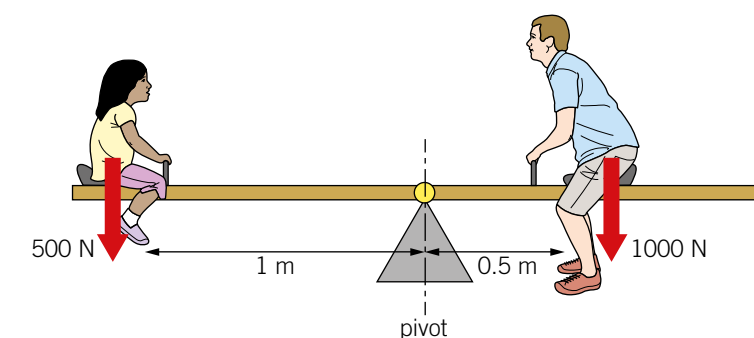
- Moments** are the turning effect of a force.
- The unit for the moment is **newton metres (Nm)**.

$$\text{moment (Nm)} = \text{force (N)} \times \text{perpendicular distance from the pivot (m)}$$

- To calculate the moment you multiply the force applied by the distance from the **pivot**.
- The bigger the force, or the further the distance, the bigger the moment.

The law of moments

During **equilibrium**, all the clockwise moments added together must equal all of the anticlockwise moments added together.



$$\begin{aligned} \text{clockwise moment} &= \text{force} \times \text{distance on the right} \\ &= 1000 \text{ N} \times 0.5 \text{ m} \\ &= 500 \text{ Nm} \end{aligned}$$

$$\begin{aligned} \text{anticlockwise moment} &= \text{force} \times \text{distance on the left} \\ &= 500 \text{ N} \times 1 \text{ m} \\ &= 500 \text{ Nm} \end{aligned}$$

The moments in the example above are the same. This is how see-saws balance.

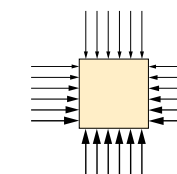
Pressure in solids

- Pressure is the force exerted on a surface because of weight, and is measured in **newtons per metre squared**.
- For small areas you can use centimetres instead.
- Pressure explains why studded boots help you grip grass, or why snowshoes help you walk in snow.

$$\text{pressure (N/m}^2\text{)} = \frac{\text{force (N)}}{\text{area (m}^2\text{)}}$$

Pressure in liquids

- Solids and liquids are **incompressible**, because all the particles are touching already. This means they pass pressure on.
- The pressure at the bottom of a liquid is bigger than the top, because of the weight of the water liquid pushing down pressure increases with depth.



Objects float because of **upthrust**. Liquid pressure produces this upthrust. In the example, the object floats because the upthrust acting on the bottom of it is stronger than the forces acting on the top.



Key terms

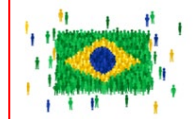
Make sure you can write definitions for these key terms.

atmospheric pressure compress distance-time graph gas pressure incompressible law of moments liquid pressure moment motion newton metres newtons per metre square
pressure relative pivot speed

Year 8 GG KNOWLEDGE
ORGANISER:
BRAZIL



Y8 BRAZIL



Background facts

Brazil location: South America. Total population: approx 211mil

Climate: Brazil has a range of climates. Most of Brazil lies in the tropics so it is hot and wet all year, with an average temperature of around 25°C. The East and South of Brazil is wetter than the Northeast (the *Sertao*, in the NE, is the driest region).

The Amazon Basin: Brazil is home to the largest tropical rainforest in the world. It crosses into 9 countries! It covers 40% of Brazil. The **River Amazon** rises in Peru and flows to the Atlantic Ocean. It's the world's second longest river – 6580km long (The Nile is the longest).

Population: In 1500, there were approx. 5 million indigenous people/tribes living in Brazil. In 1500, Portuguese sailing ships arrived. The Portuguese colonised Brazil. Brazil only got independence from Portugal in 1825. Today approx. 200 000 Indigenous people's live in the Amazon. Some are 'uncontacted'.

Trade: In the early 1500s, the Portuguese exported timber from their new colony. Then they switched to sugar cane and needed workers – the indigenous people worked for them at first – but they soon rebelled so the Portuguese began to buy slaves from Africa. In 1888, the slave trade was abolished in Brazil. Today, Brazil trades beef, soybeans, iron, raw sugar, crude oil and poultry amongst other goods.

Employment: around 10% of people are employed in the primary sector (agriculture, fishing, farming and forestry), 21% are employed in secondary sector (manufacturing and industry) and 58% are employed in the tertiary sector (services). Child labour still exists.

Development indicators: (2023) GNI – US\$4 Trillion. GNI per capita - US\$19,000. Human Development Index – 0.786; Life Expectancy – 76 years. Literacy Rate: 93%. Mean years in school: 8 (UK: 13). Infant mortality rate: 12.9 per 1,000

Inequality: Some people are very wealthy, but many are very poor. The Portuguese kings originally gave out land as gifts. The landowners got rich but paid their workers very low wages.

Urbanisation

Urbanisation: This is the increasing amount of people living in urban areas (towns and cities). 86% of Brazil's population live in urban areas.

Rural-urban Migration This is when people move from rural areas (isolated countryside) to urban areas (towns and cities).

Pull Factors This is a reason people migrate to a place. Some examples include better healthcare, employment opportunities, access to education or to be with family and friends. **Push factors** are things that make people want to leave – no jobs, no amenities, a difficult life.

Infrastructure This means motorways, airports, ports, bridges, roads, railways, dams and buildings. New highways in Brazil will link the Amazon cities to each other. Highways will make travel in Brazil much easier. The new railways will carry trade as well as people. New dams are planned for the region.

CHALLENGES OF URBANISATION in Rio De Janeiro:

Inequalities in services In 2013 only 55% of Rio de Janeiro (a city in Brazil) had access to a health clinic. There is also a shortage of nearby schools. Around 12% of Rio's population do not have access to clean water. The whole of Rio suffer from frequent power cuts.

Squatter Settlements in Brazil are called favelas. They are illegal settlements where people have built homes on land that they do not own. This is often a result of rural-urban migration. Rocinha is the largest favelas in Rio de Janeiro. There is limited access to services like electricity, rubbish collection and sewage pipes in squatter settlements and they are areas of poverty and deprivation with.

Crime Robbery and violent crime present great challenges for favelas. Murder, kidnapping, armed assault occur regularly. In 2013, Pacifying Police Units started to patrol squatter settlements, but there are still many favelas rule by drug gangs even today.

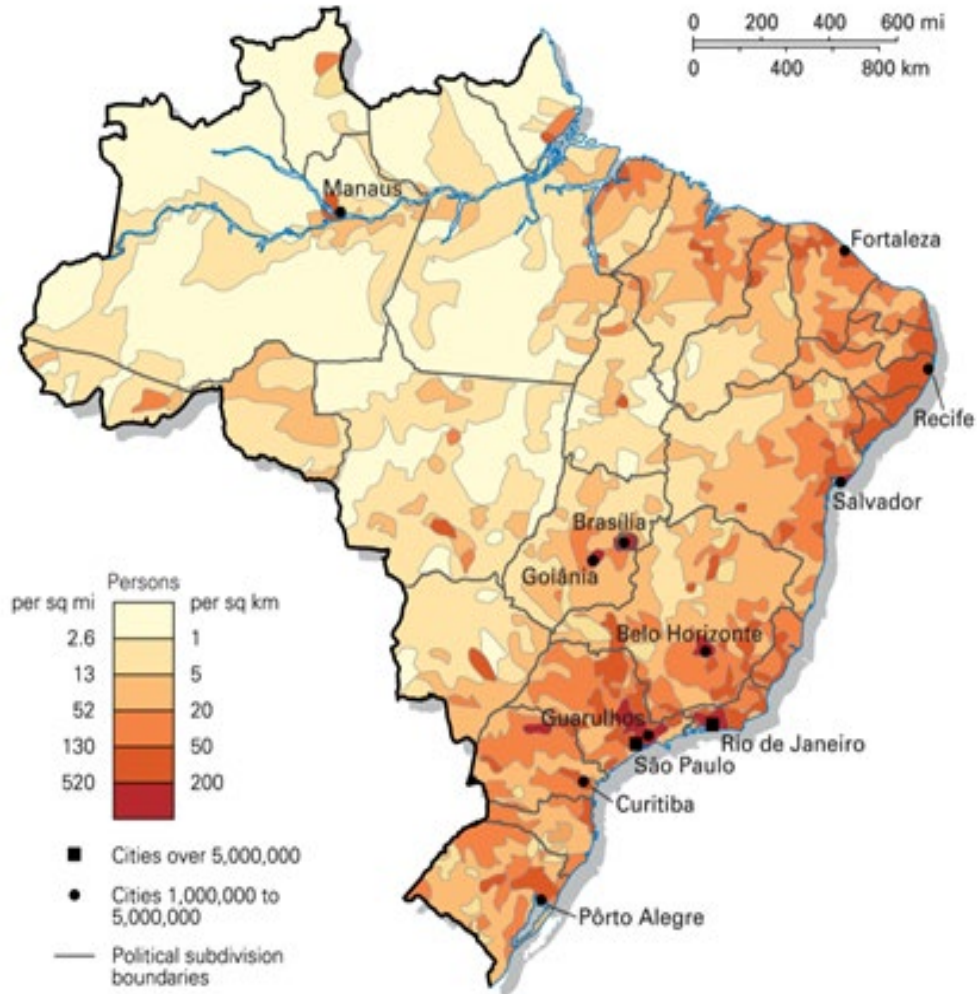
Traffic Congestion Rio de Janeiro is the most congested city in South America. Traffic congestion increasing air pollution. It occurs due to limited road networks, as roads can only be built on coastal stretches

Brazil's population

Population distribution

Population Density the average number of people per square kilometre.

Population distribution: how the population is spread out across Brazil: Most of the population is concentrated along the coast. Lowest densities are in the Amazon basin.

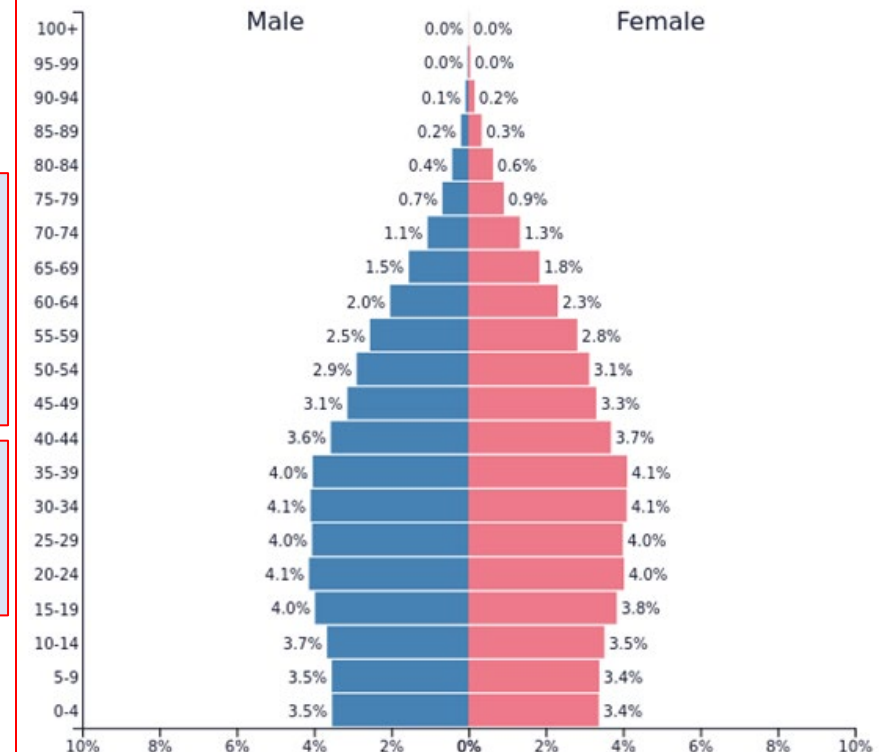


Biodiversity: the number of species (living organisms) in a given area. The loss of biodiversity can throw an entire ecosystem — and the resources it provides — out of balance. One concerning example of this is the possibility of massive deforestation causing the Amazon rainforest to reach a **“tipping point.”** This means the hydrological cycle would be disrupted to the point that it triggers a massive forest “die-back” that could **turn vast areas of the rainforest into a savannah**, and with it lose immeasurable amounts of biodiversity.

Population Structure

Population pyramid
Shows number of males and females in each age group. There are many more young people than older people in Brazil.

Brazilians trace their origins from three main sources: Europeans, Amerindians and Africans.

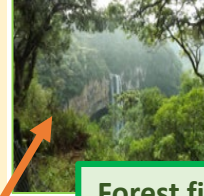


Brazil's ecosystems

Cerrado
Climate is two well-defined seasons. Grasslands, Savannahs and dry forests. It is the second largest biome. It covers 21% of territory in Brazil.

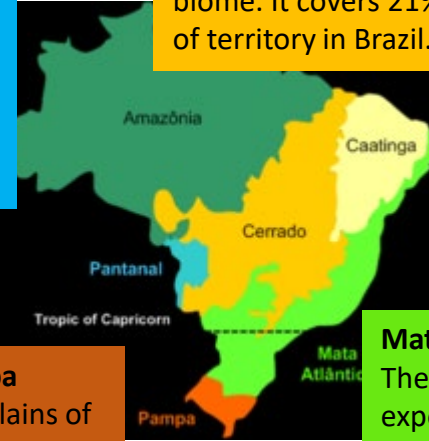


Caatinga
Dry climate and dry soils like a desert with few trees, shrubs and cacti.



Mata Atlântica
The Atlantic Forest has exposure to humid winds that blow from the ocean. Only 10% is left.

Pampa
Flat plains of grassland. Many cattle ranches.



Pantanal An alluvial (mud) plain influenced by rivers that drain the basin of the Upper Paraguay into a vast swamp, where it develops rare plants and animals in abundance.



The Amazon Rainforest

The value of the Amazon Rainforest

1. Medicines: e.g. 25% of cancer fighting drugs contain resources from the tropical rainforest.
2. Rainforests regulate rainfall.
3. Rainforests produce oxygen.
4. Rainforests provide fruit and nuts.
5. 80% of the world's biodiversity can be found in the tropical rainforest.
6. Rainforests act as a carbon store.
7. A home to the indigenous people.

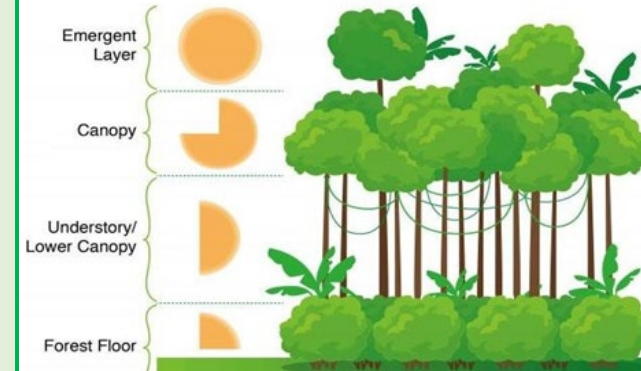
Forest fires: When vegetation is very arid (dry) and temperatures are high, fires can start and spread easily. Thousands of fires burn annually across the Amazon rainforest.

Deforestation: This is the removal of trees. The main cause of deforestation is to make space for agriculture. 80% of deforestation in the Amazon is due to agriculture. In just the last 50 years, one third of all tropical rainforests have been destroyed and disappeared, to become farms (soya, palm oil, cattle, etc). From August 2018 to July 2019, the Amazon lost over 3,800 sq. miles of forest — an area equivalent to over 1.8 million football fields.

The consequences of deforestation:

1. Biodiversity loss. The extinction of species is happening at rates never seen before — [up to a thousand times faster than what would happen naturally](#);
2. Climate change locally and globally and forest fires.
3. Broken nutrient cycle and soil degradation.
4. Flooding.

Rainforest Layers of Vegetation



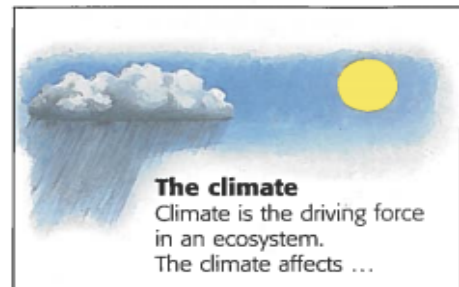
Threats to the rainforest:

1. **Cattle ranching for beef:** 80% of forest loss is for cattle farming.
2. **Soya bean farming:** Brazil is the world's largest exporter. It's used in the UK for cattle feed as well as other things.
3. **Logging for timber:** for use as furniture and in construction.
4. **Mining:** The region is rich in minerals such as iron ore, tin and nickel amongst bauxite, gold and copper. Governments are providing tax incentives for large-scale mining projects. Mining projects — on both the small-scale and large-scale — represent a great risk to water and soil given the risk of toxic leaks.
5. **'Slash and burn' agriculture:** settlers find the soil quickly becomes infertile and so they have to clear more land (by slashing down the vegetation and burning the left over off)
6. **Other: roads, settlements, HEP**

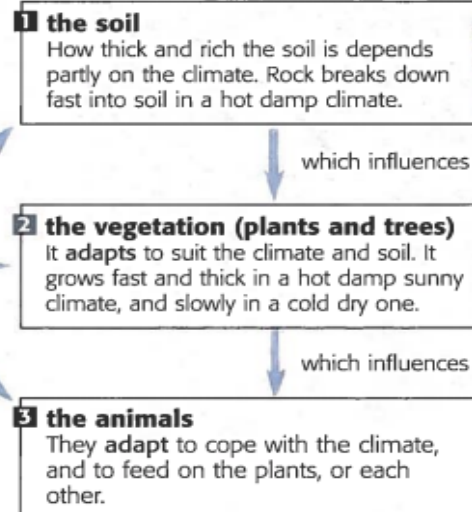
Read this: [10 facts about deforestation: cause and effects:](https://earth.org/amazon-rainforest-deforestation-facts/)
<https://earth.org/amazon-rainforest-deforestation-facts/>
<https://earth.org/deforestation-facts/>

Why are they so different?

The ecosystems in the photos all are very different — because of the climate. Look at this diagram:

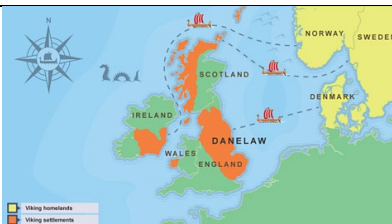


So everything in an ecosystem is linked. The plants and animals depend on each other — and on the environment.



From the Celts to the Normans

The **Celts** arrived in Britain between 1000-500BCE. They **farmed the land** and saw that Britain had many resources which it could use. The **Celts were conquered by the Roman invasion**. The Romans came to **expand their empire but also to make use of Britain's lead, tin, gold, timber and fertile lands**.



After the Romans left in 410 and **Anglo-Saxons settled in Britain**. They settled in **villages next to farmland** and set up a number of **kingdoms led by chieftains**. The Anglo-Saxons give us the name **England – Land of the Angles**.

Vikings from Scandinavia started raiding England in the 700s. They came for England's **fertile land as Norway was very hilly to grow crops and Denmark's sandy soil made animal rearing difficult**. After being defeated by Alfred of Wessex, the **Vikings settled in the north and east** in an area **called Danelaw**. The Vikings brought their own customs and today **Thursday, Friday, egg, sister and happy** come from Viking language.

When the **Normans arrived in Britain**, they changed the landscape with **castles, cathedrals and the feudal system**.

Black Tudors, 'Strangers' and the Huguenots

Black migrants in England enjoyed success under the Tudors:

John Blanke was a **trumpeter in the courts of Henry VII and Henry VIII**. Blanke successfully **petitioned Henry VIII for a pay rise** and Henry even **gave John clothes for his wedding**.

Cattelena of Almondsbury had a **cow** and supplied her neighbours with **dairy products**. She had many household items suggesting she **participated fully in village life**.



Jacques Francis was a **skilled swimmer** who dived to **retrieve canons from the wreck of the Mary Rose**. He was also the **first African to give evidence in the court of law**.

The **'Strangers' were Dutch and Flemish Protestants** who were fleeing persecution. They were invited to **Norwich** due to their **skills in weaving and to help populate the city ravaged by plague**. They made Norwich very wealthy: **Dutch roof designs, grand houses and even Norwich City Football club's mascot, the canary**, is a symbol of the 'Strangers'. The **Huguenots were French Protestants** escaping Catholic persecution. They **revitalised the industries of watch-making, gun-making and bookbinding**. They also **started Britain's paper-making industry**.

Irish and Jewish migration and the Windrush generation

Many **Irish migrated to Britain** in the 1800s to **escape extreme poverty** and **after 1846, thousands more came to escape the Irish Potato Famine**. Many found jobs as **navvies, building new canals, roads and railways** and these transport systems could not have been built without them. **Irish dancing, music and bars** are all part of British culture today.



Jews came to Britain to escape persecution in Eastern Europe where attacks called **pogroms were common**. New immigrants **worked in clothes, furniture and shoemaking** and did very well in their trades. **Marks and Spencer and Tesco were founded by Jewish immigrants and their children**.

The **Empire Windrush** arrived in 1948 with **492 people from the Caribbean to start a new life** in Britain and many more followed. The **Windrush generation were essential** to fill vital gaps in **public transport, construction, and manufacturing industries**. Thousands worked as **nurses, doctors, and support staff, becoming essential to the newly formed National Health Service**. They introduced **new musical genres and Caribbean cooking** expanding national identity.

Key Words and Vocabulary

Migration - to move from one place, region or country to another

Push factor – A negative condition or circumstances which forces a person to leave their home, region or country

Pull factor – A positive condition or quality that attracts people to move to a new location

Navvies – Manual labourers who built canals, roads and railways

Pogrom – A violent organised attack of a specific ethnic or religious group, most often directed against Jewish communities

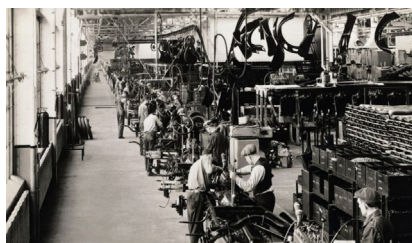
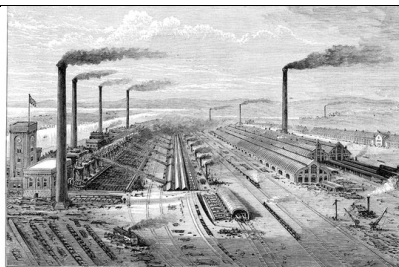


What was the Industrial Revolution?

The Industrial Revolution was an important **turning point** in British history.

Great Britain became the world's first industrialised nation and British innovation created both wealth at home and raised Britain's status and influence overseas. However, this radical change in the way British people lived and worked was traumatic for many of those involved.

In 1750, only about 15% of the population lived in towns. By 1900 it was 85%. This meant that there were far more people around to work in new industries, but this also caused problems because many more people needed foods and homes. This meant that **poverty was increasing**. Much of the population had moved to the industrialised coalfield areas in the North and the Midlands.



The entrepreneurs of the Industrial Revolution

Richard Arkwright is considered the **father of the factory system**. In 1767 he devised a simple but remarkable **spinning machine**. Replacing the work of human hands, **the water frame** made it possible to **spin cotton yarn more quickly and in greater quantities than ever before**.



George Stephenson was the man who **developed railway transport** which revolutionised Britain. This allowed goods to be shipped quicker making them cheaper, and also made **travel around the country far more efficient and cheaper**.



Isambard Kingdom Brunel was an **engineer** who was responsible for building and designing bridges, tunnels, railways and steamships. Some of his most famous accomplishments was the **Great Western Railway and the Clifton Suspension Bridge**

Factory life

Normal **shifts were usually 12-14 hours a day**, with extra time required during busy periods. Employers **preferred to employ women and children**, as they were **cheaper to pay than adult males** and children in particular had **smaller hands for the machines**. There was frequent "**strapping**" (hitting with a leather strap). Other punishments included hanging iron weights around children's necks and dowsing them in water to keep them awake.

Children who had to **crawl under the machines looking for loose threads** were known as **scavengers**. Forcing children to crawl into dangerous, unguarded machinery led to **many accidents**.

The **air was full of dust, which led to chest and lung diseases and loud noise made by machines damaged workers' hearing**.



Key Words and Vocabulary

Industrial Revolution - A time of rapid change in Britain between 1750 to 1900,

Population - The number of people living in a particular place

Invention - Something new which is created, can be an idea or an object

Poverty – State of being extremely poor

Entrepreneur – A person who sets up a business or businesses

Engineer – A person who designs and builds machines and structures.

Scavenger – Job was to work under the machinery and to gather the cotton that had been thrown off



Whitechapel and the Ripper murders

Whitechapel is **found in the East End of London** and was **renowned for its level of poverty**. In **1888** the conditions in Whitechapel made it **perfect for a murderer to get away with his crimes**:

- There was a **terrible smog from the factories** which was **yellow/green in colour called a 'Pea Souper'**; this made it **very difficult to see** more than a meter ahead
- **Houses were built very close together with lots of dark narrow alleyways linking them.**
- Many **people were homeless**. Christ Church graveyard was **nicknamed 'Itchy Park'** because **the homeless who slept there were covered in lice.**
- Many **women were unable to find work so had to resort to prostitution to survive.**
- Because of many people's **desperate situations they turned to alcohol** and Whitechapel had a lot of pubs down its main street.

1888 became known as the Autumn of Terror when **five women were murdered in Whitechapel** in gruesome circumstances. The five victims were **Mary Ann (Polly) Nichols, Annie Chapman, Liz Stride, Catherine Eddowes and Mary Jane Kelly.**



Investigating the Ripper murders

Violence and murder was not uncommon in Whitechapel but it was the nature of the murders which caught people's attention. Each victim was **killed from a knife cut to the throat and there were also mutilations.** The **only victim who was not mutilated was the third victim, Liz Stride**, but people think this is **because the murderer was disturbed.**

All the victims **also lived very close to each other** and were all **struggling to make money.** As a result they all **had to resort to prostitution to survive** which made them vulnerable. They **also were known to drink** to escape from reality. With the exception of Mary Jane Kelly, all the other victims were all found in the street as well.

H Division of the Metropolitan Police force were tasked with hunting the Ripper. This was made more difficult because of all the letters they received. Almost all were thought to be **hoaxes such as the 'Dear Boss' letter but some believe that the 'From Hell' letter was genuine.**

Witness statements were also unreliable as many were clearly **describing different people** and the **darkness and smog made it difficult** to get a good look at the potential murderer. The police also had **no forensic knowledge** and could not even tell the difference between human blood and animal blood.

Suspects

Over 50 men have been linked to the Ripper killings. Six stand out:

- 1 – **John Pizer** was shoemaker who had a **violent past** and a **known hatred of prostitutes**. He also fitted the witness descriptions. Police dismissed him due to lack of evidence.
- 2 – **Dr Cream** was **convicted of poisoning four women**. At his execution, he **shouted 'I am Jack the R....'**
- 3 – **Prince Albert** was named as **part of a conspiracy** as he was being **blackmailed by Mary Jane Kelly** as he had allegedly illegally married a Catholic woman.
- 4 – **Aaron Kosminski** was **known for violent tendencies** and a hatred of women. He was placed in an **infirmary for the insane in 1890.**
- 5 – **Montague Druitt** had **studied medicine**. It is **unknown where he was** on the night of the murders. He **committed suicide by drowning in December 1888.**
- 6 - **Francis Tumblety** was a **doctor who liked to keep a collection of human organs in jars**. He was said to be violent and hated women. He **fled London** and the murders stopped soon after.



Key Words and Vocabulary

Serial killer – A person who commits a series of murders, often with a common pattern

Pea Souper – The name given to the thick yellow-green smog that surrounded Whitechapel

Common lodging House – A building where people could rent a room or bed for a night with shared sleeping quarters. Conditions were grim.

Poverty - State of being extremely poor

H Division – The section of the Metropolitan Police Force who covered Whitechapel

Forensics –Using science to collect and examine evidence from crime scenes



The Triangular Trade and 'Middle Passage'

The trade in enslaved people was called the **triangular trade**, because it had trade in three stages, marking a rough triangle between Europe, Africa and the Americas:



1. **Manufactured goods from Europe, e.g. textiles and weapons, were taken to Africa where they were exchanged for enslaved people;**
2. **The transport of enslaved people from Africa to the Americas was known as the 'Middle Passage.'**
3. **Materials produced as a result of enslaved labour in the Americas, e.g. sugar, cotton were brought back to Europe and sold at a profit.**

Enslaved people were **captured in many different ways, including in battles, raids and kidnappings**. Others were **sold into enslavement in order to pay debts**. **Slave ships were deliberately designed to fit as many slaves on board as possible. Conditions were truly horrific. Men, women and children were crammed on board with very little food or hygienic facilities.** The average time to sail the Atlantic took **60-90 days, during which many died of illness, disease, hunger or injury. Of 12.5 million taken by slave ships between 1526 and 1867, only about 10.7 million arrived.**

The Underground Railroad and Abolition

Enslaved people in America escaped using the **Underground Railroad** which was a **secret network of routes and safe houses used by enslaved African Americans to escape and find freedom in the northern states and Canada.** **Harriet Tubman escaped enslavement along the Underground Railroad and then made 13 more trips helping others also escape and gain freedom.**



Throughout the 18th Century, **opposition began to gather against the slave trade in Britain.** The **Committee for the Abolition of the Slave Trade was led by William Wilberforce, Granville Sharp and Thomas Clarkson.** The Committee **gave public speeches to gain support and the public also heard from former enslaved people about their brutal treatment such as Olaudah Equiano.** Britain **banned the buying and selling of enslaved peoples in 1807 and then banned the ownership of enslaved peoples in 1833.**

The Plantations in America

The use of **enslaved people was very important to the development of tobacco plantations in the Chesapeake regions of Virginia, Maryland and North Carolina.** The crop required a lot of labourers and they **would have to work hard at repetitive tasks, six days a week, from sunrise to sunset.** Enslaved people provided a **source of workers who could be forced to work under these conditions.** Enslaved people **provided a similar workforce on the rice plantations of South Carolina** to that on the tobacco plantations. The hardworking enslaved people of South Carolina **helped rice plantation owners make a lot of profit. The owners earned around four times more than tobacco planters.** Enslaved people were also used on the extensive sugar plantations in the Caribbean. Over time, the **southern states of the USA concentrated on the production of cotton. Demand for cotton had greatly increased in Britain. The Industrial Revolution was taking place and steam power was being used in textile mills. Cotton was now a big and profitable business.** By 1861, cotton made up two thirds of all the United States' exports. On all plantations, **conditions for enslaved people were awful with long working hours, cruel treatment and punishments leading to a short life expectancy.**



Key Words and Vocabulary

Slavery- A relationship where one person has absolute power over another. They control their life, freedom and wealth.

Triangular Trade- The name of the system for trading slaves across the world.

Middle Passage- the journey from Africa to America for enslaved people, it took up to 2 months.

Plantation- A large farm enslaved people worked on to produce cotton, tobacco and sugar.

The Underground Railroad- The secret network of people who would help enslaved people escape to places of safety.

Abolition- Is the act of putting an end to something by law e.g. slavery.



Why did Britain want an Empire?

At its peak, around 1922, the **British Empire was the largest empire in history**, covering **nearly a quarter of the Earth's land surface** and **ruling over 458 million people**.

This vast territory, sometimes called the "**empire on which the sun never sets**," included areas across **North America, Asia, Africa, and Australia**. There were many different reasons why Britain wanted an empire:

Politics – stopping other European powers developing their empires and becoming too powerful. The East India Company actually ruled India on Britain's behalf, until Queen Victoria took control in 1877.

Religion – trying to spread the Christian faith

Ambition – hoping to get rich easily or get a good job in the government of the empire.

Land – hoping to settle down and start a new life in a new land. In 1851, many people moved to Australia as gold had been discovered

Trade – making money for British companies. **India had spices, cotton and jewels, Australia had flax and pine, South Africa had gold and diamonds and Canada had furs and timber**. All of these were in high demand.



Were there positives of being ruled by the British Empire?

Some argue the British Empire had positives for the colonies they ruled such as:

- **Electricity was introduced** to Britain's African colonies

- The **British introduced a postal and legal system to their colonies**

- **Railways were built across India**, which made it **cheaper to travel and transport food**. One viceroy, **George Nathaniel Curzon** was viceroy 1898 to 1905 and was well known for **building schools**, setting up a **national irrigation system to relieve famine** and **rebuilding the Taj Mahal**

- **Practices considered barbaric were banned** such as the ritual strangulation of widows in Fiji in the mid-19th century

It is important to note that while these aspects are **often presented as benefits**, their **implementation came with significant costs, including exploitation, violence, and the suppression of local cultures and economies**.



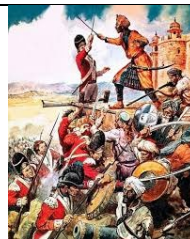
Should we be ashamed of the British Empire?

Many people suffered under the British Empire:

In **India, in 1857, a mutiny by the Sepoys** (Indian soldiers who served the British) was **brutally crushed** and Sepoys were strapped to cannons which were then fired. Also **a famine in 1943 led to the death of 3 million people** and the **help offered by the British was criticised for being inadequate and too late**.

In **Australia diseases the British brought such as smallpox, killed around half the native Australian population before 1800**. The **government tried to strip Aboriginal Australians of their heritage by taking native children and forcing them to live in white Christian homes where they were not allowed to speak their own languages or marry who they wanted to**.

In **South Africa, British conquest and administration led to the displacement of native populations, the imposition of taxes that forced people into labour, and the creation of reserves that confined the majority to small areas of land**. Any **revolts were brutally crushed**.



Key Words and Vocabulary

Empire – A single country that rules over a number of other countries

Colony – A country under full control of another country

East India Company: The British company that dominated trade between Britain and India in the 17th and 18th centuries.

Viceroy - A ruler with authority in a colony on behalf of a king or queen

Sepoys: The name given to Indian soldiers who served the British or East India Company.

Mutiny: An open rebellion against the 'proper authorities' by soldiers or sailors, usually against their officers.

Aboriginal Australians: The name given to the native Australians living in Australia before the arrival of Europeans.



Women in the 19th century

In the nineteenth century **women had a very stereotypical role in British society**. If married, **they stayed at home to look after the children while their husband worked**. If single, they did **work which usually involved some form of service such as working as a waitress, cooking**.

Many **wives could not leave their husbands** even if they wanted to, simply because they **did not have the financial independence** that was needed to survive at the time. **Also a divorce was difficult to obtain** and a **divorced woman was shunned by society**. With these obstacles, many women were **forced to stay in unhappy marriages**.

Women also **could not vote which made it difficult to improve their situation**. The men in Parliament **believed that women should not vote as they were seen to be too emotional and would be too distracted from their duties as a wife and mother**. However, **many women towards the end of the century campaigned for the right to vote**.



The Suffragists and the Suffragettes

The **Suffragists** were formed in 1897 as the **National Union of Women's Suffrage Societies (NUWSS)** with **Millicent Garrett Fawcett** as the leader.

The NUWSS **wanted to gain the right to vote for women through peaceful means - non-violent demonstrations, petitions and the lobbying of MPs**. Fawcett believed that **if the organisation was seen to be intelligent, polite and law-abiding** then women would **prove themselves responsible enough to participate in politics**.

Emmeline Pankhurst became impatient with what she saw as **slow progress of the NUWSS**. She felt that a different, more **radical, approach** was required to draw attention to the cause. In 1903 she set up the **Women's Social and Political Union (WSPU) – the suffragettes** - with the motto **deeds not words**. The suffragettes became more violent as they sought attention for their campaign. They **frequently broke the law through vandalism and attacks on property**. The **rough treatment** of the many suffragettes who were arrested and jailed such as **force feeding in prison** when they went on hunger strike **won them increasing support and sympathy from the public**.



Emily Davison and World War One

On 4th June 1907, the Suffragette **Emily Davison** **stepped in front of the King's horse** at the Epsom Derby. Today we are not certain what her intentions were but she was **knocked down by the horse and died 4 days later**.

Emily Davison was **given a martyr's funeral**. **Five thousand women** in white dresses with black armbands **marched in the funeral procession in London**. **This continued to raise support for the suffragette cause**.

When **Britain joined World War One in 1914**, women throughout the country put the campaign for the vote on hold and **stepped into traditionally male roles on the home front, working in munitions factories, on farms, and in transportation, while others served near the front lines as nurses and drivers**. This mass entry into the workforce, particularly in **munitions which was very dangerous**, had significant consequences turning women's roles in society as **more prominent and recognised**. Consequently, **women over 30 were given the vote in 1921 and women over 21 were given the vote in 1928**.



Key Words and Vocabulary

Stereotypical – a widely held and oversimplified image or idea of a particular type of person or thing.

Suffrage – The right to vote in political elections

The Suffragists – Women who campaigned for the right to vote using peaceful methods, such as petitions, public speeches, and marches.

Lobbying - Trying to influence MPs to support a specific policy

The Suffragettes – Women who campaigned for women's right to vote using violent tactics such as property damage

Martyr – Someone who dies for their belief or cause

Munitions – Military weapons and ammunition



The landmark events of the 1950s - education

In 1954, the **US Supreme Court held that segregation in education was unlawful**. In **1957, the Little Rock Nine** enrolled at Little Rock Central High School, Arkansas, which until then had been all white. The African-American students **encountered a large white mob in front of the school**, who began shouting, throwing stones, and **threatening to kill the students**. In addition, about **270 soldiers of the Arkansas National Guard, sent by Arkansas Governor Orval Faubus, blocked the school's entrance**.



The confrontation in Little Rock drew international attention and **President Eisenhower sent the 101st Airborne Division** to Little Rock to **escort the Little Rock Nine to school and between lessons**.

The Little Rock Nine **continued to face physical and verbal attacks from white students** throughout their studies at Central High. In 1958, **Ernest Green became the first African American to graduate from Little Rock Central High School**.

The Greensboro Sit-ins

The Sit-in movement began when **African American students would go to segregated lunch counters**, sit in all available spaces, request service, and then **refuse to leave when denied service because of their race**.

The **lunch-counter sit-in that began the movement, took place in Greensboro, North Carolina**, on the afternoon of February 1, 1960. **Four black students** made some purchases at the local F.W. Woolworth department store. They then **sat down at the "whites only" lunch counter** and placed an order but were **refused service**. They stayed until closing and returned the next day with more than a dozen other students. **Their peaceful demonstrations for basic legal rights and respect increased public opinion for their cause**.

The first lunch-counter sit-in began with just four participants, but **the attention paid to the protest created a movement that spread across the South in 1960 and 1961 to include 70,000 black and white participants**. It affected 20 states and **resulted in the desegregation of many local businesses in those communities**.



The Birmingham Campaign and the March on Washington

In the spring of 1963, activists in Birmingham, Alabama launched the **Birmingham Campaign, led by Martin Luther King**. It would be the beginning of a series of **lunch counter sit-ins and boycotts on shops to protest segregation laws in the city**.

Over the next couple months, the **peaceful demonstrations would be met with violent attacks using high-pressure fire hoses and police dogs on men, women and children**.

The Birmingham Campaign **ended with a victory** in May of 1963 when **local officials agreed to remove "White Only" and "Black Only" signs from restrooms and drinking fountains in Birmingham; desegregate lunch counters, and release jailed demonstrators**.

In August 1963, **Martin Luther King organised the March on Washington** where he delivered his famous 'I have a dream' speech. As a result, **President Johnson passed the landmark Civil Rights Act in 1964 banning discrimination based on race**.



Key words

Key words:

Civil Rights: The rights of citizens to political and social freedom and equality.

The Supreme Court: The highest court in the USA.

Segregation: Dividing people by race in schools, transport, cinemas and other places people gathered together.

Desegregation: the ending of the policy of racial segregation

National Guard: state-based military force

Boycott: Refusing to purchase from a business



The first years - Blitzkrieg, Dunkirk and the Battle of Britain

Germany invaded Poland on 1st September 1939 using a new method of fighting called 'Blitzkrieg'. This involved fast-moving columns of tanks supported by infantry soldiers and dive-bomber attacks. By the end of the September, the Polish armed forces had been defeated.



In the spring of 1940, Germany attacked France, Denmark, Norway, the Netherlands and Belgium. By May, Thousands of British, French and Belgian troops were trapped on the coast of France at Dunkirk. Hitler was close to wiping out the entire British army. The British government organised a huge rescue operation called Operation Dynamo. The plan was to evacuate troops to Britain using warships. A request was made to citizens to help the evacuation using their own small boats, fishing boats, yachts and even rowing boats. Between 26th May and 4th June over 800 boats rescued around 200,000 and 140,000 French and Belgian troops from the beaches of Dunkirk.

Britain now stood alone and Hitler made plans to invade. However, before he could transport his troops across the English Channel he had to destroy Britain's air force. The German began a series of air raids but the Royal Air Force fought back in the Battle of Britain. Hitler did not manage to destroy the Royal Air Force and withdrew his plans for invasion.

New allies – Operation Barbarossa and Pearl Harbor

Hitler had failed to defeat the Royal Air Force in the Battle of Britain and by 1941 turned his attention to USSR.

Hitler had a number of reasons to attack the USSR; he wanted Russian lands as living space for Germans, he wanted to destroy communism and he wanted control of the wheatfields and oil within the USSR. Operation



Barbarossa, the invasion of the Soviet Union began on 22nd June 1941. The German army split into three – Army Group North went north and put Leningrad (St Petersburg today) under siege, Army Group Centre moved towards Moscow and Army Group South looked to take over the oil fields then the city of Stalingrad. The attack started well for the Germans and they almost got the Moscow, but when winter came in 1941, the Germans suffered as their weapons didn't work in the cold and they didn't have enough warm clothing. This gave the Russians time to regroup and they pushed the Germans back from Moscow and in 1943 Germany was defeated at the Battle of Stalingrad. Britain made an alliance with the USSR agreeing to help each other to defeat Hitler and Germany.

On 7th December 1941, the Japanese, Germany's allies, bombed the US navy at Pearl Harbor. This event brought the USA into the war against Germany. Britain now had both the USSR and USA as allies and planned to take back France.

End of the War – D-Day and Hiroshima

By early 1944 the Germans had been pushed back in the east by the Russians and Britain and the US were planning an invasion to take back Europe from the Germans.

An invasion of France would be tricky as Hitler had built his 'Atlantic Wall' defences. The British and Americans planned for months and the invasion codenamed

Operation Overlord happened on 6th June 1944. Over 156,000 British, American and Canadian soldiers landed on five beaches along the Normandy coast. The Allies successfully secured the beaches allowing them to push further inland. Paris was liberated on August 25th 1944. The Allies pushed to liberate the rest of France and force the German armies into retreat. The Russians were also pushing the Germans back from the East and in May Berlin was captured. Germany formally surrendered on 8th May 1945 – VE Day.

However, war still continued in Japan with the USA. The Japanese put up a strong resistance and would not surrender. On 6th August 1945, the US detonated an atomic bomb over the city of Hiroshima and on the 9th another on the city of Nagasaki. Japan surrendered on 15th August.



Key words

Blitzkrieg – German for 'lightning war'.

The Germans used a combination of aircraft bombing, tanks and infantry to quickly defeat the enemy.

USSR – The Soviet Union, with Russia being the most powerful country in the Soviet Union

Communism – A political ideology for a classless society where everything is owned by the people collectively, not individuals

Atlantic Wall – A 1,670 mile coastal defence and fortification system built by Nazi Germany to prevent an Allied invasion of Europe.

VE Day – Victory in Europe Day where Nazi Germany surrendered.

Atomic bomb – A bomb that gets its destructive power from nuclear energy



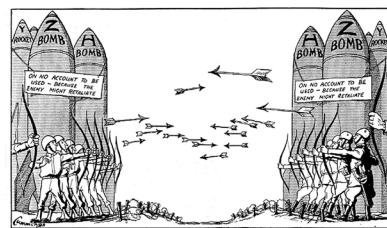
Why was there a Cold War?

After World War Two, the **USA and the Soviet Union emerged as two of the most powerful countries in the world – superpowers.** However, the USA and the Soviet Union **did not trust each other as they were divided politically.**

The **USA was capitalist** where everyone has the right to own their own property or business and people have a choice of who to vote into government.

On the other hand, **the Soviet Union was communist** where all land and business is taken over by the government on behalf of the people. Society would be classless and would have no need for political parties.

The **Cold War was a decades-long political standoff after between the United States (capitalist West) and the Soviet Union (communist East).** It was called "cold" because they never fought directly, but competed fiercely through proxy wars, arms races, the space race, espionage, and propaganda to spread their ideologies globally.

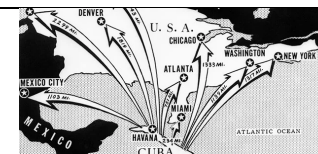


The Berlin Wall and The Cuban Missile Crisis

After WW2, Germany was divided into four zones controlled by the US, UK, France and the Soviet Union. Germany's capital Berlin was within the Soviet zone and so divided into four zones. Western Berlin (US, UK and France) had a high standard of living, but the East (Soviet Union) was much poorer.

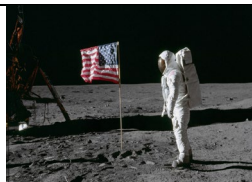
By 1958, three million East Germans crossed to the West. This was a problem to the East, as the refugees included many valuable workers such as teachers and engineers. On the 12th of August 1961, a barbed wire fence was put up around the West Berlin with the purpose of stopping refugees. The barbed wire was soon replaced by a concrete wall. The Walls were patrolled and there were towers used as guard posts, which ensured that no one could get in or out of West Berlin.

On the 14th of October 1962, American spy planes over Cuba took pictures of what looked like launch pads for nuclear missiles, that would be able to reach American cities. There was also a fleet of Soviet ships approaching Cuba, possibly to deliver the missiles. President Kennedy had three choices: to attack Cuba, to sink the Soviet ships or to bomb the missiles sites. Kennedy chose instead to set up a naval blockade around Cuba not letting in the Soviet ships. When the Soviet ships reached the blockade on 24th of October they turned around, averting potential nuclear war.



Cold War rivalry - the Space Race

Both countries **wanted to prove their superiority by showing that they could develop space travel more quickly than the other.** Each country was **concerned that its rival would gain a military advantage in space, especially by being able to launch nuclear ICBMs from space.**



Oct 1957 - **Soviets launched Sputnik** - the first man-made satellite into space.

Nov 1957 - **Soviets put the first living creature into space**, a dog named Laika.

Aug 1961 - **Soviet cosmonaut Yuri Gagarin became the first man in space.**

July 1963 - Soviet cosmonaut **Valentina Tereshkova became the first woman in space.**

July 1969 - **American astronaut Neil Armstrong became the first man to walk on the moon.**

Who won the Space Race? Although **Neil Armstrong's moon landing is arguably the best-remembered event**, the **Soviet Union achieved almost all other major milestones first.** By 1975, the two had begun to cooperate, and they launched a joint space flight

Key words

Cold War – Decades of struggle and distrust between the USA and the Soviet Union but there was no direct fighting between the two countries.

Capitalism – A political system where different political parties exist and individuals could own their own property and businesses

Communism – A system where there is no private ownership and no class system. Due to this there is no need for political parties

Ideology – A set of beliefs held by individuals or groups

Proxy Wars – Supporting other countries in their regional conflicts e.g. Korea or Vietnam

Arms Race – Building up of nuclear weapons

Space Race – Competing to dominate space exploration

Espionage – Spying against foreign states





What is E-safety?

Phishing

Phishing is when attackers send scam emails or text messages that either:

1. Contain malware (such as ransomware) which can sabotage computer systems.
2. Or they might be designed to trick users into revealing sensitive information such as password or bank details
3. Or try and trick you into transferring money from your bank account

TOP TIPS

- Do not give out private information.
- Do not download or click on any links.
- Do not respond to any messages.

Research how you can spot a phishing message

Hoaxes and Fake News

- **Fake news** are false stories that might make you feel worried or scared about what's happening in the world.
 - **Viral messages** containing false information can easily be shared on messaging apps like WhatsApp and Messenger between friends so you are more likely to believe it
 - **Deep fakes** are videos where people's faces are edited to make it look like they said or did something they didn't.
- Top Tip: Become a critical thinker: Where/who did it come from? Is the Source Reliable? What evidence is there to support it? Is that evidence trustworthy?**

Who can you report inappropriate content to online?

Cyberbullying

Bullying someone through any use of technology.



Before you:



T Is it True?

H Is it Helpful?

I Is it Inspiring?

N Is it Necessary?

K Is it Kind?



Sextortion

is a crime when an online predator tricks someone into giving them nude images and then demands money or more images by threatening to share the images with the victim's friends or family if they don't comply.

This crime is sweeping the web and 11-17 year olds especially boys are becoming victims

Key Words



Cyberbullying
Online Safety
E-safety
Username
Password
Social media
Sextortion
Fake News
Phishing
Malware
Scam





What is E-safety?

Stay Safe Online

Don't post personal information online.

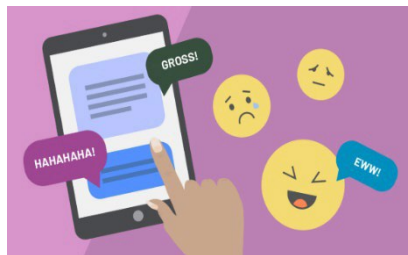
1. Think carefully about positing any images or videos of yourself.
2. Keep privacy settings as high as possible.
3. Keep your password safe.
4. Don't befriend people you don't know.
5. Don't meet up with people you have met online.
6. Think before you say.
7. Treat others with respect, don't be rude!
8. If you see something which makes you feel unsafe, scared or uncomfortable. Report it!

Cyberbullying

Cyberbullying is bullying someone through any use of technology

TOP TIPS if you are being bullied online:

- Block them
- Keep the evidence
- Tell people: a trusted adult or friend
- Don't reply Don't retaliate
- Click on the report button



Who can you report inappropriate content to online?



Or tell an adult!

A strong password should have:

- Letters
- Capital Letters
- Numbers
- Symbols
- 8 or more characters



Key Words



File

Email Address

Attachment

Internet

E-safety

Username

Password

Private information

Deep Fakes

Fake News

Critical Thinker

Social media

Inappropriate
content

Cyberbullying

Hacking

Malware

Stretch and Challenge
Can you design an
advert for a new
e-safety campaign for
Year 7 pupils?

What is digital literacy?

Digital literacy is the skill of learning how to read, write, use and edit digital products on a computer.

Some of the skills we have looked at are:
Word processing & Presentation Skills

What is Word Processing?

Word processing is what we call creating documents by type and editing text.

Most people use **Microsoft Word** to process word documents.



Features of Word Processing

Some of the features of word processing are:

- Entering and editing text
- Formatting text
- Saving
- Printing
- Cutting, copying and pasting
- Spell checking

Tools in Word Processing

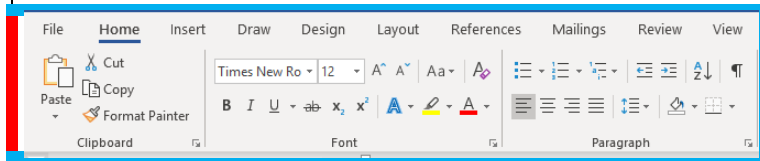
Below is an example of the **Ribbon** in Microsoft Word. The ribbon is made up of lots of different **Tabs**.

File Home Insert Draw Design Layout References Mailings Review View

Tabs

In each Tab we have different **Groups**.

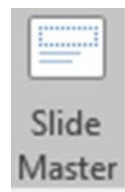
This is where all options will be grouped together e.g to change the appearance of the font text you look in the group called **Font**



Slide Master

In **Microsoft PowerPoint** there are lots of design themes that you can choose to make your presentation more visually appealing.

The **Slide Master** can be used to create your own custom theme and layout to personalise your presentation.



Multimedia & Digital Literacy

Key Words

Word Processing		Animation	
Transition	Edit	Ribbon	
Presentation	Font	Tab	

Presentation skills

Presenting your work in a clear and professional manner is an important skills.

Most people use **Microsoft PowerPoint** to create and perform presentations.



Features of PowerPoint

Some of the features of PowerPoint are:

- Create, edit and remove slides
- Insert images, gifs, videos
- Design slides / themes
- Animate content / Add transitions between slides
- Edit text, images, sound and video
- Present as slideshow

Presentation tips

1. Keep it Simple
2. Limit bullet points & text
3. Limit transitions & builds (animation)
4. Have a consistent visual theme
5. Choose your fonts carefully
6. Use high-quality graphics
7. Use appropriate charts
8. Use a consistent House Style
9. Use video or audio where appropriate
10. Spend time in the slide sorter

Tools in PowerPoint

Below is an example of the **Ribbon** in Microsoft PowerPoint. The ribbon is made up of lots of different **Tabs**.

File Home Insert Design Transitions Animations Slide Show Review



Python Programming

While loop

```
number = 1
while number < 5:
    print(number)
    number = number + 1
```

For Loop

```
for counter in range(5):
    print("Hello world")
```

Calculations

Addition

3+5

Division

30/3

Multiplication

10*4

Subtraction

2-1

Whole number division

16//3

Find remainder

16%3

Variable: A piece of data that you can alter that has also been given a name

Sequence: More than one instruction to be followed in order

Algorithm: Step by step instructions to solve a problem

Selection: When a computer executes instructions if a particular condition is met or not

Iteration: The process of repeating a specific part of code

Create lists

```
fruit = ["Apple", "Banana", "Orange"]

#Display list
print(fruit)

#Display single item
print(fruit[2])
```

Operator	Description
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to
==	Equal to
!=	Not equal to

Data type	Description	Data type	Description
Bool	Boolean	float	Number with decimal
Int	Number	str	Character string

Basic if statement

```
num = int(input("please enter a number: "))
if num > 10:
    print("Too high")
else:
    print("Thank you")
```

Complex if statement

```
if num > 10:
    print("Too High")
elif num < 0:
    print("Too Low")
else:
    print("Thank You")
```

Converting between data types:

```
int(s)
float(s)
int(float(s))
```

How to print

```
print("Hello world")
```

Combine multiple outputs

```
print("6+2=", 6+2)
OR
print("6+2=", 6+2, "and 6-2 =", 6-2)
```

Input and using variables

Assigning variables

```
number = 1
```

Printing variables

```
print(number)
print(number * 5)
```

Inputting strings (text)

```
name = input("What is your name: ")
```

Inputting strings (numbers)

```
age = int(input("How old are you? "))
```

Output variable

```
print("hello", name)
print("You're", age, "years old")
print("In 10 years you will be", age+10)
```

Nesting

```
num = float(input("Enter a number: "))
if num >= 0:
    if num == 0:
        print("Zero")
    else:
        print("Positive number")
else:
    print("Negative number")
```

COMPUTING Year 8 – Topic 3 : Graphics and Legislation

Topic Overview : You will learn about creating and editing different graphics: vector images using Adobe Illustrator and bitmap images using Adobe Photoshop.

Key content/ ideas/ concepts

Legal issues

Legal issues and events that adhere to or break the law.

Data Protection Act 1998	This Act states that anyone who stores personal details must keep them secure. Companies with computer systems that store any personal data must have processes and security designed into the system to meet this .
Freedom of Information Act 2000	This Act gives people access to data held by public authorities, including state schools, police forces, local authorities and the NHS. It does not give access to personal data about people, but it means, for example, that anyone can ask for a list of all of the state schools in a certain area.
Computer Misuse Act 1990	This Act has three main principles, designed to prevent unauthorised access or 'hacking' of programs or data. These are: unauthorised access to computer material; unauthorised access with intent to commit a crime; unauthorised modification of computer material.
Copyright Designs and Patents Act 1988	This Act is designed to protect the creators of books, music, video and software from having their work illegally copied. Public cannot use their work as their own without first gaining permission.

Graphic file formats

JPEG: Joint Photographic Group
GIF Graphics Interchange Format
TIFF: Tagged Image File
BMP: Bit-mapped

Adobe Photoshop—This is an image editing software, which allows users to edit, crop, resize and correct colour on digital photos.

Rectangular marquee tool
Selects a rectangular area.

Lasso tools
Selects a shape or area.

Crop tool
Crops an image to a particular area or size.

Spot healing brush
Removes unwanted areas such as blemishes.

Brush tool
Freely draw using colours.

Clone stamp tool
Copies areas of an image

Eraser tool
Removing unwanted areas

Gradient and paint bucket
Fills large areas with colour or gradient

Blur, smudge, sharpen tools

Text tool
Adds text boxes

Dodge and burn tools
Lightens and darkens areas.

Magnifying tool
Zooms in and out of document

Layers—Show the order of items in a document.

KEYBOARD SHORTCUTS
 Ctrl + D = Deselect
 Ctrl + S = Save
 Ctrl + Z = Undo
 Ctrl + A = Select all
 Ctrl + T = Transform

Keywords/ Glossary



Vector: An image made up of shapes.

Bitmap: An image made up of pixels.



Pixels: The smallest dot in a bitmap image.

Resolution The level of detail in an image, measured in dots per inch (dpi).300 for print and 72 DPI for web.



Canvas: The window in which the picture is edited or created.



Layer: In graphics software, a layer is the term used to describe the different levels at which you can place an object or image file.



Rasterise: Rasterising a Photoshop layer converts a vector layer to pixels.



Compression: The re-encoding of data so that less bits are used to store it. Usually done to increase speed of transmission.



Lossy compression: Removes data permanently to reduce the size of a file (e.g. JPG).



Lossless compression: Organises data to reduce the size of a file without removing any information (e.g. ZIP).

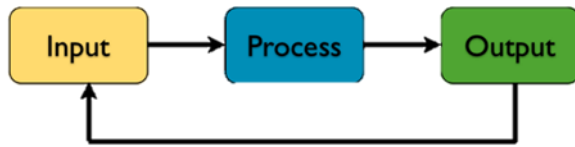
Useful sites

Photoshop tutorials—YouTube. h
 ps://www.youtube.com/watch?
 v=SQD9IMtHBoE

COMPUTING Year 8 – Topic 3 : Graphics and Legislation

What is a computer?

A computer is any device that takes an input, processes it and then outputs information.



CPU (Von Neumann)

The CPU has two main parts: **ALU & CU**

Arithmetic and Logic Unit

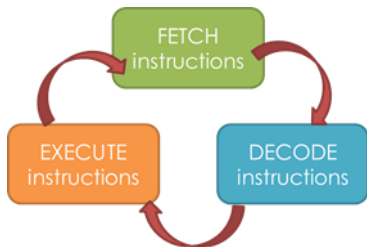
The ALU carries out all of the arithmetic and logical operations including addition, subtraction and comparisons (for example, equal to, less than, greater than).

Control Unit

The **Control Unit** uses electrical signals to direct the system to execute the instructions in stored programs.

Fetch, Decode, Execute

The main function of the CPU is to run an endless fetch-execute cycle.



The speed of the **FDE** cycle is measured in cycles per second (**hertz**). This is known as the **clock speed**.

Processors are usually measured in **giga-hertz (GHz)**

1GHz = 1 billion instructions processed.

Input Devices

An input device is a piece of hardware that can be used to enter data into a computer.



Output Devices

An output device is a piece of hardware that can be used to represent information in a variety of ways.



COMPUTER SYSTEMS

Key Words

Input

Process

Output

CPU

Heat Sink

Motherboard

RAM

Component

Hard Drive

FDE

Power Supply

Clock Speed

Components

Computer components are all the different internal parts of a computer system that help it to operate. Each component has its own purpose and functions.

Central Processing Unit

The CPU is the brain of the computer. It does all the processing and calculating for the computer.



Heat sink

A heat sink is used to draw heat away from important components such as the CPU that can get quite hot. If a component gets too hot then it won't be able to perform its job as well.



Motherboard

The motherboard is what connects all the other components. It helps keep them secure and allows the components to communicate.



Power Supply

A power supply helps to convert electricity to a suitable voltage to power the computer safely.



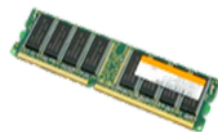
Hard Drive

A Hard Drive is where all the computer's long term data is stored i.e. data you want to keep for in the future, such as your own documents, music, films and games.



Random Access Memory

RAM is where temporary data is stored while the computer is currently being used. Once a computer is switched off this data is lost.



Network Interface Card

A network interface card (NIC) enables a computer system to connect to a network. Some allow access wirelessly.



Spreadsheets Advanced

Spreadsheets are used to store information and data. Once we have our information in a spreadsheet we can run powerful calculations, make graphs and charts and analyse patterns.

Other uses for spreadsheets –

- Modelling and Planning
- Home/Business Finance and Budgeting
- Wages/Invoices
- Predictions / Simulations / Calculations
- Creating charts and graphs



Golden rule: every formula always starts with an =

Cell references begin with a letter, and finish with a number. EG: **A1**

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							

A range is a selection of cells. EG: **A2:F4**

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							

Operators

+	Adds two numbers / cells
-	Subtracts one cell or number from another
*	Multiplies two numbers/cells
/	Divides one number / cell from another one
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to

Extra Reading

<http://www.bbc.co.uk/education/guides/zdydmp3/revision>

<http://www.bbc.co.uk/schools/gcsebitesize/ict/modelling/0spreadsheetsrev1.shtml>

Charts and graphs

Charts and graphs provide a visual representation of data, which can often be easier to understand. To make a chart, use the chart wizard or the gallery, then follow the onscreen instructions. There are several types of charts. Choose a chart based on the type of data to be displayed. The charts you can choose from include:

- line graph – to show a change over time
- pie chart – show the individual parts that make up a whole
- bar chart – compare things that aren't directly related
- scatter graph – look for a pattern or link between two sets of data

Cell formatting

To access a cell's formatting options, right-click on the cell and click 'Formatting options'. A dialogue box with the following tabs will appear:

- number – tell the spreadsheet what type of data the cell contains, eg currency, percentage, date, time, etc
- alignment – align the text in the cell vertically (top, bottom or middle), horizontally (left or right) or at an angle
- font – change the font used, text size and colour
- border – add a solid, dotted, dashed or coloured border to the cell

What is a Function?

A **function** is a standard routine used to perform common tasks. It represents a complex formula that uses reserved words e.g. VLOOKUP, IF. A **function** performs a specific set of operations on its input values to produce a single output value.

What is a Formula?

Using **formulas** in **spreadsheets** can allow you to quickly make **calculations** and get totals of multiple cells, rows, or columns in a **spreadsheet**.

Conditional Formatting

is a tool that allows you to apply **formats** to a cell or range of cells, and have that **formatting** change depending on the value of the cell or the value of a formula. For example, you can have a cell appear bold only when the value of the cell is greater than 100.

Common Formulas/Functions

= SUM	Adds a range of cells together
= AVERAGE	Finds an average for a range of cells
= MIN	Returns the smallest value in range
= MAX	Returns the highest value in a range
= COUNT	Counts cells if they meet a condition

IF

one of the logical **functions**, to return one value **if** a condition is true and another value **if** it's false. For example: **=IF(A2>B2,"Over Budget","OK")** **=IF(A2=B2,B4-A4,"")**

Count IF

=COUNTIF (Where do you want to look?, What do you want to look for?)

Auto SUM

Excel automatically enters a formula (that uses the **SUM**function) to **sum** the numbers

= COUNT

Counts cells if they meet a condition



French – Year 8 - Autumn

Point de départ... Starting point...			18	c'est marrant	it's funny	36	j'ai pris beaucoup de photos	I took a lot of photos
1	j'habite en Angleterre	I live in England	19	c'est ennuyeux	it's boring	37	j'ai vu un spectacle	I saw a show
2	on habite à Wymondham	we live in Wymondham	20	c'est triste	it's sad	38	j'ai fait une balade en bateau	I did a boat trip
3	j'ai une semaine de vacances	I have a week of holidays	21	ça me plaît	it pleases me	39	j'ai traîné à la maison	I hung out at home
4	on a trois semaines de vacances	we have three weeks of holidays	Tu as passé de bonnes vacances? Did you have a good holiday?			C'était comment? How was it?		
5	à Noël	at Christmas	22	je suis allé.e en vacances	I went on holiday	40	il faisait beau	it was good weather
6	à Pâques	at Easter	23	on est allé en Espagne	we went to Spain	41	il faisait chaud	it was hot
Qu'est-ce que tu fais pendant les vacances? What do you do during the holidays?			24	j'ai pris l'avion	I took the plane	42	il faisait froid	it was cold
7	je suis en vacances...	I am on holiday	25	on a voyagé en voiture	we travelled by car	43	il faisait mauvais	it was bad weather
8	nous sommes en vacances..	we are on holiday	26	nous avons voyagé en train	we travelled by train	44	c'était intéressant	it was interesting
9	au bord de la mer	next to the sea	27	j'ai joué au tennis	I played tennis	45	c'était génial	it was great
10	à la montagne	in the mountains	28	j'ai mangé des glaces	I ate ice creams	46	c'était fantastique	it was fantastic
11	à la campagne	in the countryside	29	j'ai retrouvé mes amis	I met my friends	47	ce n'était pas mal	it was not bad
12	en colo	at a holiday camp	30	j'ai acheté des baskets	I bought trainers	48	quel désastre!	what a disaster!
13	chez mes grands-parents	at my grandparents' house	31	j'ai écouté de la musique	I listened to music			
14	je reste dans le Norfolk	I stay in Norfolk	32	j'ai nagé dans la mer	I swam in the sea			
15	je fais du camping	I do camping	33	j'ai visité un parc d'attraction	I visited a theme park			
16	c'est nul	it's rubbish	34	j'ai regardé des clips vidéos	I watched video clips			
17	c'est sympa	it's nice	35	j'ai bu un coca au café	I drank a Coke in the cafe			

French – Year 8 - Autumn

Top 10 opinions			Top 10 connectives			Top 10 perfect tense		
1.	j'aime (beaucoup)	I like (a lot)	1.	et	and	1.	j'ai regardé	I('ve) watched
2.	je n'aime pas	I don't like	2.	mais	but	2.	je n'ai pas mangé	I did not eat
3.	je déteste	I hate	3.	tandis que	whereas	3.	j'ai perdu	I('ve) lost
4.	je préfère	I prefer	4.	car / parce que	because	4.	j'ai fini	I('ve) finished
5.	ça m'ennuie de	I get bored by	5.	cependant	however	5.	j'ai vu	I('ve) saw(seen)
6.	j'ai horreur de	I loathe/despise	6.	si	if	6.	j'ai bu	I('ve) drank(drunk)
7.	ça me plaît	it pleases me	7.	quand	when	7.	j'ai fait	I('ve) did(done)
8.	c'est	I would like	8.	bien que/ meme si	although/ even if	8.	j'ai pris	I('ve) took (taken)
9.	c'était	I think that	9.	où	then	9.	nous avons regardé	we('ve) watched
10.	ce sera	In my opinion	10.	néanmoins	nevertheless	10.	nous n'avons pas regardé	we haven't watched
Top 10 time phrases			Top 10 etre/avoir			Top ten adjectives		
1.	hier	yesterday	1.	j'ai	I have	1.	intéressant.e	interesting (m.f)
2.	l'année dernière	last year	2.	je n'ai pas (de)	I don't have (any)	2.	ennuyeux(-euse)/barbant.e	boring (m[f])
3.	la semaine dernière	last week	3.	nous (n') avons (pas de)	We (don't) have (any)	3.	amusant.e.s / drôle.s	fun (m.pl / f.pl)
4.	quand j'étais petit.e	when I was little(f)	4.	je suis	I am	4.	marrant.e.s / rigolo.te.s	funny (m.pl / f.pl)
5.	quelquefois	sometimes	5.	je ne suis pas	I am not	5.	affreux / affreuse	horrendous
6.	d'habitude	usually	6.	nous (ne) sommes (pas)	We are (not)	6.	épouvantable	terrible
7.	demain	tomorrow	7.	j'avais / j'ai eu	I had / I have had	7.	sympa	nice/kind
8.	l'année prochaine	next year	8.	j'aurai	I will have	8.	facile / difficile	easy / difficult
9.	la semaine prochaine	next week	9.	j'étais / j'ai été	I was / I have been	9.	nouveau.x/nouvelle.s	new (m.pl / f.pl)
10.	quand je serai grand.e	when I'm bigger(f)	10.	je serai	I will have	10.	vieux/vieille.s	old (m+pl/ f.pl)
Top 3 future tense			Year 8 French Universals			Top 3 past tense		
1	je vais aller	I am going to go				1	je suis allé.e	I went
2	on va aller	we are going to go				2	on est allé	we went
3	ça va être	it will be				3	c'était	it was

German – Year 8 - Autumn

Was siehst du gern? <i>What do you like to watch?</i>			16	Ich habe zu Hause eine DVD gesehen	I saw a DVD at home	Was wirst du nächstes Wochenende sehen? <i>What will you watch next week?</i>		
1	Ich gehe gern ins Kino	I like going to the cinema	17	Wir haben einen Fantasyfilm gesehen	We saw a fantasy film	33	Ich werde...sehen	I will watch...
2	Ich sehe gern Zeichentrickfilme	I like watching cartoons	18	Meine Freunde und ich sind ins Kino gegangen	My friends and I went to the cinema	34	Ich möchte... sehen	I would like to watch...
3	Ich sehe lieber Horrorfilme	I prefer to watch horror films	19	Mein Bruder hat einen Horrorfilm gesehen	My brother saw a horror film	35	gameshows	game shows
4	Ich sehe nicht gern Krimis	I don't like watching crime programmes	Wie war das? <i>How was it?</i>			36	eine Komödie	a comedy
5	Ich sehe ziemlich gern die Nachrichten	I quite like watching the news	20	Das war traumhaft	That was dreamlike	37	mit meiner familie	with my family
6	Mein Bruder sieht Sportssendungen	My brother watches sports programmes	21	Das hat Spaß gemacht	That was fun	38	mit meinen Freunden	with my friends
7	Meine Mutter sieht gern Seifenopern	My mum likes watching soap operas	22	Das war spannend	That was exciting	38	Das wird...sein	That will be...
Warum? <i>Why?</i>			23	Das war kindisch	That was childish	39	Das wäre...	That would be...
8	,weil das Spaß macht	...because it is fun	Was hast du dort gegessen? <i>What did you eat there?</i>			Key opinion phrases		
9	,weil sie gruselig sind	...because they are scary	24	Ich habe... gegessen	I ate...	40	Ich denke...	I think...
10	,weil sie kindisch sind	...because they are childish	25	Wir haben ... gegessen	We ate...	41	Ich glaube...	I believe...
11	,denn sie sind langweilig	because they are boring	26	Meine Schwester hat... gegessen	My sister ate...	42	Meiner Meinung nach...*	In my opinion
12	,denn das ist langweilig	because that is boring	27	ganz viel Popcorn	loads of popcorn	43	Ich finde...	I find...
13	,den sie sind interessant	because they are interesting	28	viel Pizza	a lot of pizza	44	Am liebsten...*	I most like...
Was hast du gestern gesehen? <i>What did you watch yesterday?</i>			29	Ich habe... getrunken	I drank...	45	Ich mag...	I like
14	Ich bin ins Kino gegangen	I went to the cinema	30	Wir haben ... getrunken	We drank...	46	Ich ...* lieber	I prefer...
15	Ich habe eine Komödie gesehen	I saw a comedy	31	Mein Vater hat ... getrunken	My dad drunk...	*verb goes here		
			32	wasser	water			

German – Year 8 - Autumn

Top 10 opinions			Top 10 connectives			Top 10 perfect tense		
1.	Ich mag...(sehr)	I like...(a lot)	1.	und	and	1.	Ich habe... gespielt	I played
2.	Ich mag...(nicht)	I (don't) like...	2.	aber	but	2.	Ich habe... gehört	I listened
3.	Ich hasse	I hate	3.	oder	or	3.	Ich habe... gesehen	I watched
4.	Ich liebe	I love	4.	denn / weil	because	4.	Ich habe... gegessen	I ate
5.	Es ist (nicht)	It is (not)	5.	jedoch	however	5.	Ich habe... getrunken	I drank
6.	Ich finde	I find	6.	wenn	if	6.	Ich habe... gelesen	I read
7.	(Jazz) nervt mich (nicht)	(Jazz) (doesn't) annoy me	7.	sodern	rather	7.	Wir haben... gespielt	We played
8.	(Pop) gefällt mir nicht	(Pop) doesn't please me	8.	trotzdem	nevertheless	8.	Wir haben... gesehen	We watched
9.	Ich würde sagen	I would say that	9.	dann	then	9.	Ich bin ... gegangen	I went
10.	Das ist schade	That is a shame	10.	der/die/das	which/who	10.	Wir sind... gegangen	We went
Top 10 time phrase			Top 10 sein/haben			Top ten adjectives		
1.	samstag(morgen)s	on Saturday (mornings)	1.	Ich bin	I am	1.	gruselig	scary
2.	sonntag(nachmittag)s	on Sunday (afternoons)	2.	Er ist	He is	2.	teuer	expensive
3.	montag(abend)s	on Monday (evenings)	3.	Sie ist	She is	3.	kindisch	childish
4.	jetzt	now	4.	Es ist	It is	4.	nützlich	useful
5.	jeden Tag	every day	5.	Wir sind	We are	5.	nutzlos	useless
6.	heute	today	6.	Ich habe	I have	6.	lang	long
7.	morgen	tomorrow	7.	Er hat	He has	7.	(un)wichtig	(un)important
8.	gestern	yesterday	8.	Sie hat	She has	8.	schlecht	bad
9.	ab und zu	now and then	9.	Es hat	It has	9.	schwierig	difficult
10.	zweimal pro Woche	twice a week	10.	Wir haben	We have	10.	einfach	easy
Top 5 future tense			Year 8 German Universals			Top 5 intensifiers		
1	Ich werde...sehen	I will watch...				1	ein bißchen	a bit
2	Ich werde...essen	I will eat...				2	ziemlich	quite
3	Ich werde...trinken	I will drink...				3	sehr	very
4	Wir werden...spielen	We will play...				4	total	totally
5	Wir werden...gehen	We will go...				5	echt	really

Spanish – Year 8 - Autumn

¿Qué te gusta comer y beber? <i>What do you like to eat?</i>			¿Qué comes/ cenas? <i>What do you have for lunch/ dinner?</i>			40	tengo sed	I'm thirsty
1	me gusta(n) mucho ...	I really like...	21	como...	I have for lunch	41	soy sano/a	I am healthy
2	me encanta(n)...	I love	22	un bocadilo	a sandwich	42	es malsano/a	he/she is unhealthy
3	no me gusta(n) nada...	I don't like...at all	23	ceno...	I have for dinner	43	suelo comer	I usually eat
4	odio...	I hate	24	pollo con ensalada	chicken with salad	44	solemos comer	We usually eat
5	prefiero...	I prefer	25	cenamos...	We have for dinner	Adjectives		
6	el agua	the water	26	las hamburguesas	hamburgers	45	porque	because
7	el arroz	rice	27	desayuno a las siete	I have breakfast at 7	46	es sano/a	it's healthy
8	los caramelos	sweets	28	como a las dos	I have lunch at 2	47	es malsano/a	it's unhealthy
9	la carne	meat	29	ceno a la nueve	I have dinner at 9	48	es delicioso/a	it's delicious
10	la fruta	fruit	¿Qué comiste? <i>What did you eat?</i>			49	es asqueroso/a	it's disgusting
11	los huevos	eggs	30	fui a un restaurante	I went to a restaurant	50	es dulce	it's sweet
12	la leche	milk	31	mi familia y yo fuimos a un restaurante	my family and I went to a restaurant			
13	el marisco	seafood	32	comí	I ate			
14	el pescado	fish	33	comimos	we ate			
15	el queso	cheese	34	bebí	I drank			
¿Qué desayunas? <i>What are you having for breakfast?</i>			35	bebimos	we drank			
16	desayuno	for breakfast I have	36	voy a ir a un restaurante	I am going to go to a restaurant			
17	cereales	cereal	37	voy a comer	I am going to eat			
18	tostadas	toast	38	vamos a comer	we are going to eat			
19	zum de naranja	orange juice	¿Qué mas? <i>What else?</i>					
20	no desayuno nada	I don't have anything for breakfast	39	tengo hambre	I'm hungry			

Spanish – Year 8 - Autumn

Top 10 opinions			Top 10 connectives			Top 10 preterite tense		
1	me gusta	I like	1	y	and	1	comí	I ate
2	no me gusta	I don't like	2	pero	but	2	comimos	we ate
3	odio	I hate	3	también	also	3	bebí	I drank
4	prefiero	I prefer	4	porque/dado que	because	4	fue	It was
5	me chifla	I really like	5	sin embargo	however	5	visité	I visited
6	me aburre	It bores me	6	si	if	6	vi	I saw
7	me encanta	I love	7	mientras	whereas	7	descansé	I relaxed
8	es	(it) is	8	aunque	although	8	escuché	I listened
9	fue	(it) was	9	donde	where	9	saqué	I took
10	será	(it) will be	10	no obstante	nevertheless	10	fue	It was
Top 10 time phrase			Top 10 ir/hacer			Top ten adjectives		
1	ayer	yesterday	1	voy	I go	1	interesante.s	interesting s.pl
2	el año pasado	last year	2	vamos	we go	2	bonito.a.os.as	pretty m.f.mp.fp
3	la semana pasada	last week	3	fui	I went	3	grande.es	big m.f.mp.fp
4	de vez en cuando	from time to time	4	fuimos	we went	4	pequeño.a.os.as	small m.f.mp.fp
5	a veces	sometimes	5	voy a ir	I am going to go	5	delicioso.a.os.as	delicious m.f.mp.fp
6	normalmente	normally	6	hago	I do	6	relajante.s	relaxing s.pl
7	dos veces a la semana	twice a week	7	hace	he/she/it does	7	educativo.a.os.as	educational m.f.mp.fp
8	todos los días	every day	8.	hice	I did	8	entretenido.a.os.as	entertaining m.f.mp.fp
9	la semana que viene	next week	9	hizo	he/she/it did	9	sano.a.os.as	healthy m.f.mp.fp
10	cuando sea mayor	when I am older	10	hicimos	we did	10	malsano.a.os.as	unhealthy m.f.mp.fp
Top 3 future			Year 8 Spanish Universals			Top 3 high level phrases		
1	voy a ir	I am going to go				1	es importante que sea	It is important that it is
2	voy a ver	I am going to see				2	no pienso que sea	I don't think that it is
3	va a ser	it is going to be				3	me gustaría	I would like

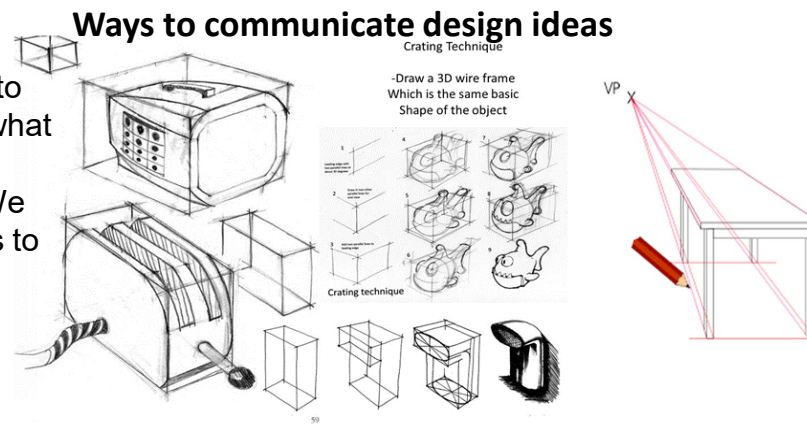
Keywords and definitions	
Keyword	Definition
Soldering	Joining components on a circuit board by melting solder
Circuit Board	A board made from epoxy resin, with tracks in copper that allows components to be added
Electrical Current	The flow of the charge of electrons
Isometric	A 3D drawing using 30 degree angles showing an object on 3 sides at the right dimensions
Crating	Using cubes and cuboids to rough out a shape when drawing in isometric
1pt perspective	A 3D drawing technique using one vanishing point on a horizon line
2pt perspective	A 3D drawing technique using 2 vanishing points on a horizon line
Development Modelling	Creating a model of a product to test it out
Context	A theme that puts a problem in a particular situation
Thermoforming polymer	Plastics which when heated and be moulded, reheated and moulded over and over again
Thermosetting polymers	Polymers that when heated set in shape and if heated again burn or melt and cannot be reused

LIGHTING SOLUTIONS - YEAR 8

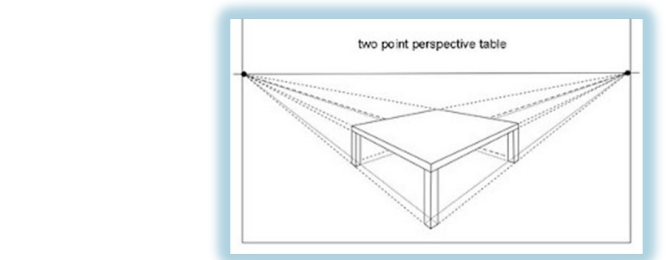
Looking for problems to solve in a context

In Design and Technology we look at designing solutions to problems. We often use a context to help us think about what problems to solve. Using a context or theme can help us explore what possible problems we might help to solve. We use lots of questions to help us think of possible problems to solve, who for, where they happen and what and why the product is needed?

Providing a low powered light for a home



What?	What sort of light could you make? List a few places lights could help- a desk/ bedside table
Aesthetics	What design inspiration will you use? Will there be a theme? What colour schemes will you use? Will you include any added decoration(laser or vinyl stickers)? What shape?
Target market	Who is your target market and why? How does this design meet their needs?
Safety	How will you ensure it is safe for the user to use? Where will the electronics be? And while you are making it how will you keep yourself safe.
Environment	What is the environmental impact of making your product? Could it be recycled or use recycled materials? Where do the materials you are using come from?
Material	What properties do the materials need? Why this material?
Cost	What will it cost to make your design? How much could you sell it for? What will your target market pay
Manufacture	What tools and equipment do you think you might need to use?



Crating: We use crating to create isometric drawing of objects. We use isometric cubes on top of each other to create a crate around the object and draw within the crates to keep everything in line

1pt perspective. We use 1pt perspective to create a simple shape. All the lines go back to a vanishing point on the horizon.

2pt perspective We often use 2pt perspective for designing houses, or making our drawings look imposing. We use two points on the horizon line and all the horizontal lines go back to these points.

How Polymers are made

Most polymers are made from Oil, it has to be drilled out of the ground and is a **finite** source. This means it will run out. When the **crude oil** is removed it goes through a process called **fractional distillation**. From this we get **Naptha**, which is used to make most of the plastics we use, the process of turning the Naptha into Polymers is **Polymerisation**

Polymer categories

There are two main categories of polymers

Thermoforming polymers

- Soften when heated
- Can be reshaped
- More commonly used in schools
- Can be recycled

Thermosetting polymers

- Initially set by heat
- Cannot be reshaped once set
- Extremely strong and durable



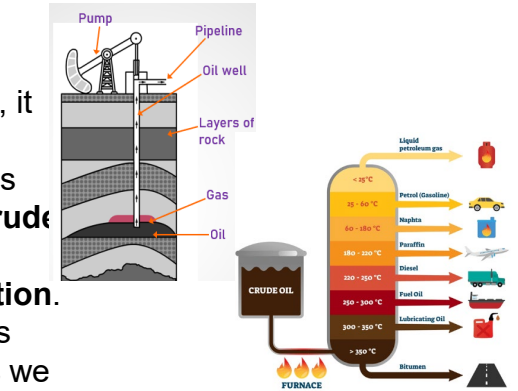
Epoxy resin
ER used for
glue



Polyester
resin PR
used in
fibreglass
to make
canoes



Melamine formaldehyde
MF- used for plastic
tableware



These are the most common **thermoforming polymers**. To help separate them for recycling they have a number on them. You can see what products are made from which polymers

	Polyethylene Terephthalate		
	High-Density Polyethylene		
	Polyvinyl Chloride		
	Low-Density Polyethylene		
	Polypropylene		
	Polystyrene		
	Other		

Ways to join your lighting solution together

Joining Method	Example	Uses
Comb joint		A comb joint has equally spaced sections. It is used for joining flat pieces together called carcass joints
Dowel Joint		A dowel joint uses dowel to link the two pieces of wood used in frames and carcasses
Mitre joint		A mitre joint is cut at an angle usually for frame joints. They can be any angle, but are usually 45 degrees to make a right angle
Rivets		Plastic push rivets will hold thin sheet material together
Screws		Screws are used to join different materials together
PVA Glue		PVA glue is used to make the joints stay together permanently

Soldering

A soldering iron is used to heat up the wire on the component and the connection on the circuit board. Solder is added, which melts and joins the component to the circuit board. Take the solder off first, then the soldering iron off to let the solder set. You must make sure each component is soldered on securely and that none of the connections join up- as this could create a short circuit

Electrical Components and their symbols

Cell

Battery (2 cells)

Wire

Motor

Bell

Switch of

Switch on

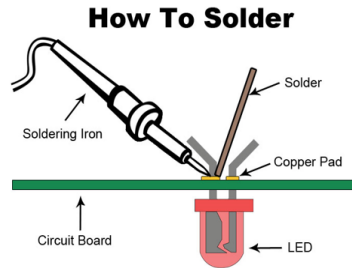
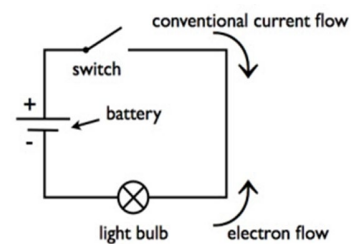
Lamp

LED (Light Emitting Diode)

Resistor

Circuit diagrams

We use circuit diagrams so that they can be read by anyone. The symbols used are standard, so it is clear what components are being used. Straight lines join the circuit to show the flow of electricity and make it clear to read.



Year 8- Global Goals and Marble run



Problem Solving

Sometimes we have to look at the problem in more detail to help us think of solutions. If we just focus on our first answer- it might not be the right one for the people involved. As designers we need to consider the following areas- The people it affects and why? What it needs to do ? What resources we have available? What technology there is to help? If there is a budget? How it will impact environmentally? What it needs to look like? Where it is needed? The space/ size it needs? The safety of the product? How humans interact with it?



Global Goals

There are 17 Global goals, these are the aims that the United Nations have agreed on that every country needs to improve to ensure we have a sustainable planet. To make good solutions to the problem we need to think about the people it affects, how it will affect the planet and is it financially viable? People, Planet, Profit is a good way to remember the points to make a product sustainable



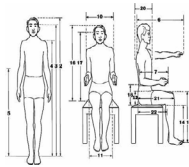
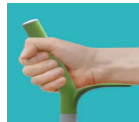
People



Planet



Profit



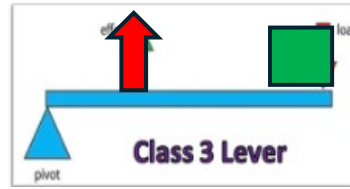
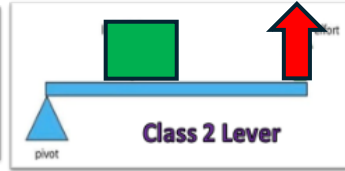
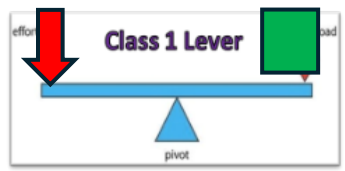
Anthropometrics

To choose what size to make a product we need anthropometric data. This is being collected all the time on different ages and in different countries, as it changes. From the data, designers use the information of people between the 5th percentile and the 95th percentile. This would make a product suitable for 90% of the population. Designers need to select the best measurement to use. If they were designing a door they would use the 95th percentile, so most people could walk through the door. If they wanted to add a window the bottom of the window would use the 5th percentile measurement so most people could see through it. Anthropometric data makes sure the size is safe and comfortable for most people to use.

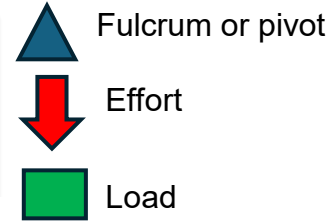
Keywords and Definitions

Keyword	Definition
Global Goals	A set of issues to improve sustainability across the world.
Fulcrum	The pivot on which a lever is balanced
Lever	A way of increasing mechanical advantage
Motion	A movement in a mechanism
Smart Material	A material that responds to a stimulus and returns back after the stimulus is removed
Modern material	A material made in the last 100 years
Input	In a circuit a switch, keyboard, tablet a way to add information
Processor	The Brain of the computer that processors the information from the input and sends it to the output
Output	The outcome in a circuit eg a light/ sound/ movement
Future technologies	Technology that is just being explored or not yet available but maybe possible
Ergonomics	This is how we interact with products, making it easier, more comfortable and safe to use.
Anthropometrics	The measurements of humans- lots of different measurements will be taken of people all over the world
Design thinking	Trying to solve problems by using the way designers look at a problem- identify, research, iterate, evaluate

Year 8- Global Goals and Marble run



Levers



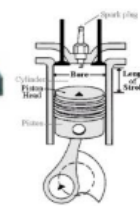
Levers are used to increase the mechanical advantage. So you can use less effort to get a greater output than you put in. Levers are used to help us lift, move, grasp, squash etc.. There are 3 classes or types of lever. One way to remember whether it is a first, 2nd or 3rd class lever is FLE, 123- so on class 1 the fulcrum is in the middle, on a class 2 the load is in the middle and class 3 the effort is in the middle.



Types of Motion in mechanisms

Types of Motion

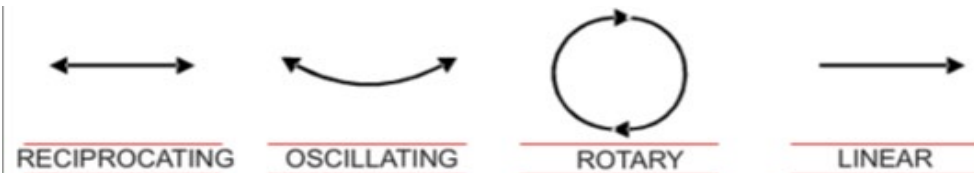
- Linear motion
 - motion in a straight line (example: train on a track)
- Reciprocating motion
 - linear motion that goes back and forth (example: pushing a slider-crank back and forth, such as the piston in an internal combustion engine)
- Rotary motion
 - circular motion (example: the hands of a clock moving, or a wheel on an axle)
- Oscillating motion
 - circular or arc-motion back and forth (example: the swing of a pendulum or the turning and release of a doorknob)



Ergonomics



To make a product ergonomic, we need to think about more than just the shape of it. We need to make it **easier to use** and therefore safer. We need to think about the **colour**, will it indicate what part to hold or not for example. Whether it needs **light**, to tell us if it is on or off. Could it have **sound** to alert us like a beep on a car parking sensor? Is the **font** clear for us to read, so we can fill a kettle up to the right level? Is it the right **size** to fit the majority of people? It is **shaped** to fit our bodies to make is **comfortable** and **safe** to use for longer periods of time? All of these points make a product more ergonomic, we need to think about this when designing



Future technologies

In the last 50 years we have had a digital revolution that has transformed how we live, work and relax. AI is set to make even more changes in your lifetime. New materials and ways of manufacturing are changing and we can think about how future technology might change our world and help us solve design problems

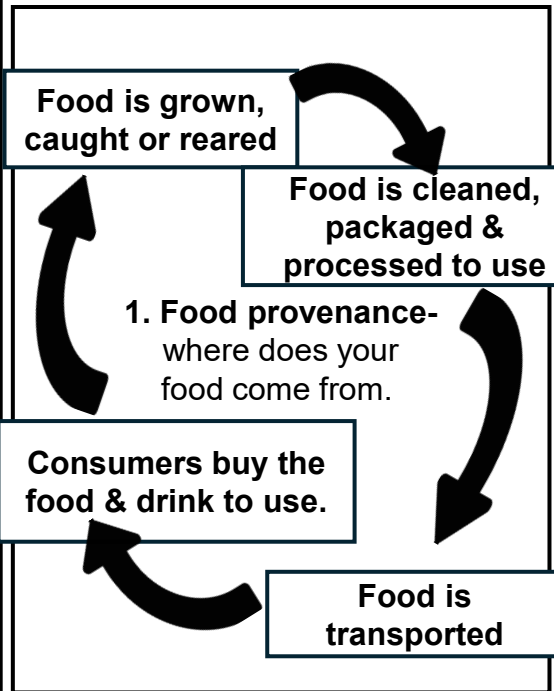
Smart and Modern Materials

Smart materials respond to their environment- so they can change when heat, light, pressure, water or are added

Modern materials are being developed all the time, they are new materials made in the last 100 years that humans have created to have different properties to work for us.

Smart material	Reacts to	What happens to the material?	What is it/ could it be used for?
Polymorph	Hot water (62%)	It becomes pliable It solidifies on cooling	Can be modelled and shaped
Thermochromic pigment	Changes in heat	It changes colour In response to heat	Mug – colour changing Baby feeding spoons
Photochromic pigment	Changes in light	It will change opacity	Sunglasses which change colour in light, windows which change in sunlight
Nitinol	Hot water	Can rebound into its original form	Dental braces, opening windows in greenhouses, stents in surgery
Interactive textiles	Human body	Electronic devices are integrated or embedded	Interacts/communicates with the wearer Heart rate/ diabetes
Micro encapsulation	Being broken	It can release smells / oils/moisturisers/antiseptics	Fabrics, such as silver in antibacterial socks, perfume samples, Scratch and sniff

Year 8 Food Provenance Knowledge Organiser

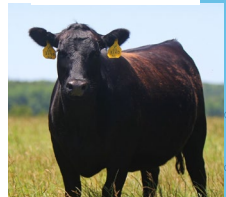


2. Food miles
 – the distance food has travelled to get to your plate. Food must travel from the farm it is grown, or reared on or the factory it is made in, to a supermarket or shop to be sold to the consumer; we would may also factor in the way you transport your food home. We consider the Carbon Emissions created to transport & process the food.

Carbon Emissions - **carbon emissions** – harmful gases such as **carbon dioxide** are released into the earth's atmosphere when we use *fossil fuels* to provide energy. We need energy to grow, produce and transport food. Some food uses more energy than others.

The examples on the World Map below show food moving to the UK as part of their journey.

Bananas -
 West Indies travel
 4000 miles to the UK



Beef - Argentina travel
 7000 miles to the UK



Tomatoes -
 Spain travel 1000
 miles to the UK



Lamb - New Zealand travel
 11,000 miles to the UK



British Beef & Chicken -
 All year



British Lamb - Spring

3. Seasonality - when food is ready and ripe throughout the year. Eg UK strawberries are ripe & ready to use in the Summer time. If we wanted strawberries in the Winter, we would have to buy them from somewhere else in the world and **import** them to the UK.
 E.g Spain & they would travel via truck or boat or plane to be sold here.
 We import around 50% of our food but 87% of our fruit.

4. Farming in the UK
East of England- wheat, barley & vegetables in fields.
South East- & Scotland- grain, potatoes & sugar beet. UK cauliflowers are grown in the south east.
South West- Rich grass for dairy cows.
North West, Wales and Scotland- cattle & sheep. Sheep can survive the cold winters on hills & moors.
Northern Ireland- cattle, sheep, pigs & dairy.
Plant crops are grown all over the UK- wheat, barley, oats, rapeseed for oil, potatoes, sugar beet & fruit & vegetables.



Year 8 Food Processing Knowledge Organiser

1. Primary processing – wheat to flour

Wheat, barley, & oats are all types of cereal grains (edible grasses) that we grow in the UK. We use these in a variety of ways usually flour. Primary processing of the wheat to flour must be done first. This process is called milling. Grain is cleaned and then passed through rollers and sieves to open and separate different parts of the grain. We produce different flours for different purposes.

White, Brown, Wholemeal, Malted, Strong, Wheatgerm, Plain & Self raising

2. Secondary processing – Flour to bread

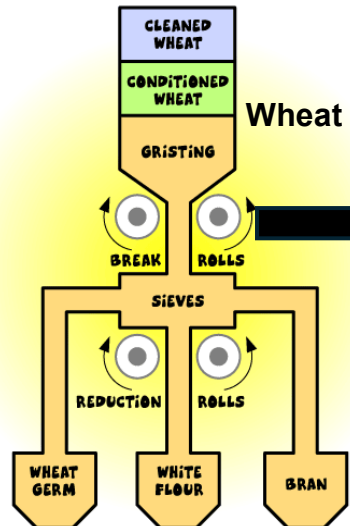
Flour can be secondary processed into a food product e.g bread. Bread is a staple food.

4 basic ingredients are used:

- Flour
- Yeast (makes the bread rise)
- Salt (adds flavour & aids proving)
- Warm water

Fat can extend shelf life.

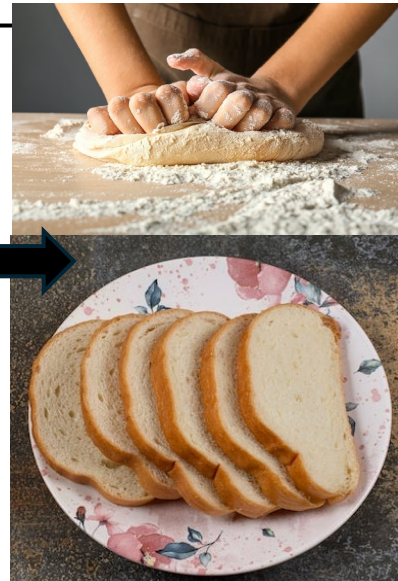
All white bread & flour, commercially sold in the UK must be fortified with calcium, iron & B vitamins.



Wheat to flour



Flour to bread



Present

Late 1940s

3. Past, Present & Future of Food

Food shopping & the ordering of food has changed over the last century, significantly with technologically developments. For example, Robotic waiters, Drone delivery & Coop robot delivery. We use smart technology to pay for our food & can use self-checkouts to scan and pay for our food using cashless devices.

This is a huge difference to shopping in the 1940s where we had rations due to World War 2, queues to hand a list to the shopkeeper.

Food generally was weighed out & this meant less food wastage & people not over-eating to excess.

4. Food science key terms

Enzymic browning - the oxygen reacts with the enzymes in the cut surface of fruits & turn brown.

Raising agents- Anything that causes rising within foods and are usually used in baked goods. E.g Biological – yeast

Denaturation- the change in the structure of protein molecules. The process results in the unfolding of the protein's structure. Factors which contribute are heat, salts, pH level & mechanical action.

Heat transfer to food.

Conduction – Direct contact with food to a surface
Convection - Currents of hot air or liquid transfer heat to food.
Radiation - energy in the forms of waves

Immediate Effects of Exercise on the Body

(During Exercise)

Respiratory System

Changes

- Increased Breathing Rate
- Increased Tidal Volume
- Increased Minute Volume



Effect

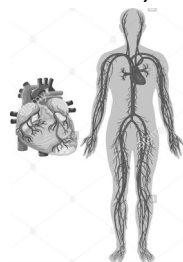
More air can be breathed in per breathe (tidal volume) and per minute (minute volume = tidal volume x respiratory rate).

This means more oxygen can be passed into the blood stream and taken to the heart AND more carbon dioxide can be breathed out.

Circulatory System

Changes

- Increased Heart Rate (100 – 150BPM)
- Increased Stroke Volume
- Increased Cardiac Output



Effect

More blood carrying oxygen is sent to your working muscles so that more energy can be produced.

ALSO due to more energy being produced, more carbon dioxide will be produced which needs to be taken back to the lungs so that it can be removed from the body.

Muscular System

- Muscles create HEAT when they contract.
- Performer sweats to help cool them down.
- Performers look red as blood flows closer to the skin (vasodilation)

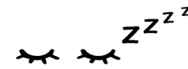
Effects of Exercise



Short Term Effects of Exercise on the Body

(24 – 36 hours after exercise)

Fatigue:



-A day after strenuous exercise muscles often feel heavy and tired.

Nausea:



- People can feel sick due to over exerting themselves during an activity.

Dizziness and lightheadedness:



- People can feel dizzy and light headed due to low blood sugar levels.

Delayed onset muscle soreness (DOMS)



- Pain or stiffness in muscles a day or two after exercise.

- Caused by tiny tears in muscle fibres leading to swelling. Muscles are supposed to tear; they repair stronger which is the main benefit of training. DOMS is not cramp – cramp is a painful contraction of muscle caused by fatigue, often linked to dehydration and loss of minerals due to sweating.

Long Term Effects of Exercise on the Body

(Months and Years of exercising)

Changes in Body Structure

- Reduced body weight – fat stores are used to create energy (fat is burnt off)
- Increased size of muscle (Muscular Hypertrophy) – muscles get bigger and stronger



Musculoskeletal System

- Increase in muscular strength – weight training (anaerobic)
- Increase in muscular endurance – circuit training (repeated actions)
- Increase in flexibility – due to repeated movements at a joint and the levels of synovial fluid within the joints.
- Tendons and ligaments get stronger – stabilise the joint

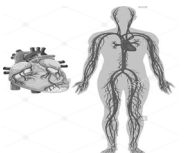


Other Components of Fitness

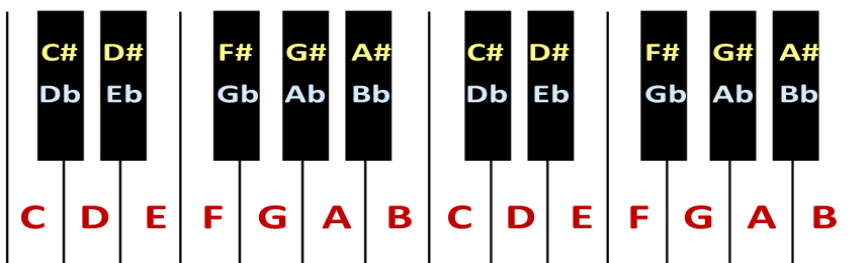
- Increase in speed – rapid anaerobic movements
- Increase in cardiovascular endurance – continued aerobic movements which cause capillarisation around muscles and alveoli, increase in strength of diaphragm, intercostal muscles or sternomastocleidoid which then creates a larger chest cavity so more alveoli can be used.

Cardiorespiratory System

- Increase in Stroke Volume – larger heart (Hypertrophy)
- Heart rate can be increased for a longer period of time
- Resting heart rate is reduced - Bradycardia



Year 8: Autumn Music KO



a) Timeline

Decade	Style	Artists	Stylistic Features
1950s	Rock n Roll	Elvis Presley, Bill Haley & His Comets, Chuck Berry	12 bar blues 4/4 time signature Walking bass
1960s	British Invasion	The Beatles, The Rolling Stones, The Who	4/4 time signature Heavy use of electric guitar playing 'riffs' and 'power chords'
1970s	Reggae	Bob Marley, Toots and the Maytals , Burning Spear	4/4 time signature Skanking - off beat guitar chop Bass usually plays a syncopated riff Harmonically simple
1980s	Synthpop	Soft Cell, The Human League, Gary Numan	Heavy use of the synthesisers Use of f.x. 4/4 time signature
1990s	Britpop	Oasis, Blur, Suede	4/4 time signature Simple chord progressions

b) Structure

The order of sections within a piece

Intro

Used to introduce a hook/riff that leads into the verse

Verse

Usually uses consistent chord sequence but with varying lyrics

Chorus

Repeating section that contains the 'hook'

Bridge

Contrasting section that links two sections together

Outro

Used to bring the song to a conclusion

c) Arrangement

A customised version of the piece

Features that can be changed ..

- Structure
- Tempo
- Dynamics
- Style
- Instrumentation

Year 8: Autumn Music KO

d) Key Words	Definition	Diagram
Synthesiser	Electronic device that uses waveforms to create sound. Often has a keyboard interface.	
Electric Guitar	A guitar that needs amplifying. Pickups on an electric guitar capture the vibrations produced by the guitar strings and turn it into an electrical signal before it is amplified.	
Sample/ Sampling	The process of taking a recorded segment of sound and editing it to fit into a song. A 'sample' refers to the segment of sound.	
Sequencing	The method of creating musical ideas through patterns and shapes.	
F.X.	Sound effects applied to instruments during the recording process. Popular effects include: • Reverb - an effect used to add a sense of space/reflection to a sound • Delay - an effect that adds repeated echos to a sound • Distortion - popular effect applied to guitars to generate an aggressive rock tone	

Artist: The Beatles

Key Members: Paul McCartney, Ringo Starr, George Harrison, John Lennon

Hit Songs: Day Tripper, Here Comes The Sun, She Loves You

Origins: formed in Liverpool in 1960. 'Please Please Me' topped the charts for 30 weeks!

Artist: Bob Marley and the Wailers

Key Members: Bob Marley

Hit Songs: No Women No Cry, Stir it Up, Three Little Birds

Origins: Jamaican guitarist, singer and songwriter. Sold more than 75 million records worldwide!

Artist: Elvis Presley

Key Members: Elvis Presley

Hit Songs: Hound Dog, Jailhouse Rock, Can't Help Falling in Love

Origins: The 'King of Rock and Roll'. American singer and actor from Mississippi. Has had 149 songs appear on the Billboard Hot 100 Pop Chart.

Wymondham High Academy Knowledge Organiser – Drama – Year 8- Ernie's Incredible Illucinations

Key content/ ideas/ concepts

PLOT SUMMARY

Ernie's Incredible Illucinations is a bright comedy based on the extraordinary powers of Ernie Fraser, a day-dreamer with a difference. Like all schoolboys Ernie has a vivid imagination, but Ernie's thoughts have a disturbing habit of turning into reality. After a number of embarrassing episodes, Ernie's parents decide to consult a doctor, who is sceptical. Several, of Ernie's adventures are acted out for us in flashback, but when Ernie fails to produce a Brass Band on demand, the doctor diagnoses group hallucination and recommends a visit to a specialist.

PLAYWRIGHT

Sir Alan Ayckbourn is an Olivier and Tony Award winning playwright. He lives in Scarborough, North Yorkshire, and has written 90 full-length plays, many of which have been produced in London's West End and New York as well as around the world. *Ernie's Incredible Illucinations* was Alan Ayckbourn's first success as a writer for a younger audience and has proved to be astonishingly long-lived is currently considered the most performed of all of Alan Ayckbourn's plays!

COMEDY

The play itself is comedic in style, and characters can be caricatures and exaggerated. Much of the characters can be performed using the style of melodrama and slapstick comedy. The improbable situations from secret agents to a boxing granny allow performers to exaggerate the humour in the and The play was adapted into television by the BBC and broadcast on BBC1 on 11 November 1987.

FIRST PERFORMERD

Ernie's Incredible Illucinations was first performed at the Unicorn Theatre for Children, London in September 1971.Since then it has become a very popular play for young audiences.

Keywords/Definitions

Stage Combat- A specialised technique in theatre designed to create the illusion of physical combat without causing harm to the performers

Soundscape- A series of sounds created by performers (not words, echoes, repetition, or speaking together) that evoke a specific setting or atmosphere

Synchronised Movements- Where two or more actors move at the same time

Marking the Moment- This is a way of highlighting the most important moment in a scene in order to draw the audience's attention to its significance.

Flashback/ Flashforward- Ways in which a narrative's discourse re-order's a given story: by "flashing back" to an earlier point in the story or "flashing forward" to a moment later in the chronological sequence .

Cross Cutting where two scenes are intercut to establish continuity. In drama and theatre the term is used to describe two or more scenes which are performed on stage at the same time. This makes it possible to juxtapose scenes or snippets of scenes that happen at different times or in different places.



Wymondham High Academy Knowledge Organiser – Drama – Year 8- Language of Drama

Key words and definitions			TECHNIQUES	
VOICE		MOVEMENT	Marking the moment	Highlighting a key moment in a scene.
Volume	How loudly or softly the voice level is.	Gesture	Thought tracking	Character in a still image or freeze frame speak their inner thoughts out loud.
Tone	The emotional quality of the voice.	Posture	Hot seating	A character is questions about their background, behaviour and motivation.
Pitch	How high or low the voice sounds.	Facial Expression	Cross cutting	The dramatic action switches between two scenes in the same space.
Pause	A break or a breath when speaking.		Choral speaking	Many actors speaking the same lines at the same time.
Silence	Deliberately not speaking.	Body Language	Slow motion	Performing a moment extremely slowly to create tension.
Accent talking	A particular way of associated with a geographical area or social class.		Narration	One or more performers speak directly to the audience to tell a story or give information.
Projection	Using the voice so that he audience can hear everything being said.	Gait	Role on the wall	Developing thoughts and ideas about a character.
Articulation	How clearly the speaker pronounces words.	Stillness	Soundscapes	A group creates a sound of a place/location using voices and bodies.
		Proxemics	Flashback/forward	Create before and after a scene.
			Freeze frame	Like pressing pause on the TV remote control.
			Still image	Arranging the actors in an image.
			Improvisation	Creating a scene spontaneously

YEAR 8 HALF TERM 1: WHAT HAPPENED TO MOSES?

COVENANTS

- A covenant is a sacred agreement between God and humans. The first, covenant between God and Abraham is the Abrahamic Covenant. In it, God promises to give Abraham “as many descendants as the stars in the sky,” and that he will grant them a “Promised Land” of their own.
- The Covenant between Moses and God renews God’s commitment to the Israelites, his chosen people (Abraham’s descendants). The Israelites agree to follow the rules God sets out for them, and in exchange God promises to protect them, and to use them to spread his power through the world: they become a “nation of priests.”
- One of the key themes of Judaism, Christianity, and Islam, is that humans cannot live up to God’s expectations, but God always keeps his promises, even when humans fail. In Christianity, God sends Jesus to renew and remake the old covenants. In Islam, Muhammad is a final prophet who makes God’s expectations to humans clear at last.

THE EXODUS

- Exodus is the name of the 2nd book of the Torah, the Hebrew Bible. It means “exit” and describes the story of Moses leading the enslaved Israelites (Jewish people) out of Egypt and into freedom.
- Pharaoh, the Egyptian god-king ordered all Jewish boys be killed, after his sorcerers warned him that a Jewish man would threaten his rule one day.
- Yocheved, Moses’ mother placed him in a basket in the river and trusted that God would protect him. The baby Moses is discovered by Batya, Pharaoh’s daughter, and raised as a member of her own family.
- Later, when exiled in the desert, Moses sees the Burning Bush, through which God commands him to liberate the Israelites from their slavery.
- Pharaoh refuses to let the Israelites go, so God sends 10 terrible plagues to punish the Egyptians. The last plague, the death of the firstborn, kills all of the Egyptian children, including Pharaoh’s own son. The Israelites are spared because God tells them to paint the blood of a lamb on their doors, and their homes would be “passed over” by the plague.
- Moses leads his people into the desert, parting the Red Sea to cross into Sinai.

RELIGIOUS EXPERIENCES

WILLIAM JAMES...

Ineffable: religious experiences are hard to talk about

Noetic: religious experiences involve gaining knowledge

Passive: religious experiences “happen to” a person

Transient: religious experiences don’t last long, though their effects might

EXPLANATIONS...

Real: a religious experience is evidence for something we cannot explain

Physical cause: the experience can be explained by something happening in our brains

Psychological: the experience can be explained because of our emotions, expectations, etc.

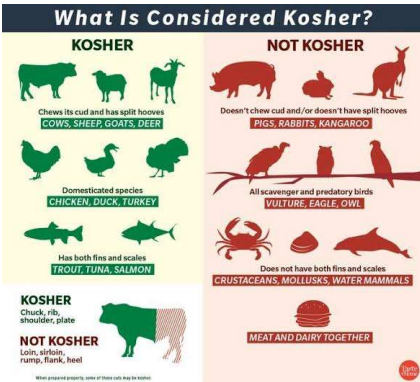
KEY TERMS

<i>Religious experience</i>	an experience understood by the person having it as an encounter with God, God's power, or God's agents
<i>Testimony</i>	a form of evidence: someone's description of what they experienced
<i>Principle of Credulity</i>	Swinburne's idea that we should trust what people report unless we have good reason not to
<i>Numinous</i>	Otto's word for the feeling of standing before something holy and wholly beyond us
<i>Hallucination</i>	an experience of something that feels real but is not physically present
<i>Veridical</i>	genuinely true or real; a veridical experience is a true perception of something that is really there
<i>Near-death experience</i>	a vivid experience reported by some people who came close to death, often during cardiac arrest

YEAR 8 HALF TERM 2: HOW DO JEWISH PEOPLE LIVE?

THE LAW (MITZVOT)

- Mitzvot refers to the 613 Commandments God revealed as part of the Mosaic Covenant. It includes the 10 Commandments, and lots of rules about social life, justice, and hygiene.
- Shabbat**: one of the commandments it to keep one day of the week separate for the worship of God. For Jewish people, this is Shabbat, Saturday. Many Jewish people do not work on Shabbat, and use this time to attend Synagogue, share a meal with family, or pray.
- Kashrut**: the food laws of the Mitzvot explain which foods Jewish people can and cannot eat. Food suitable for consumption is called “kosher.”



BAR/BAT MITZVAH

- Bar Mitzvah (boys) and Bat Mitzvah (girls) are both coming-of-age ceremonies for Jewish children aged 12-13.
- To prepare, a young Jewish person chooses a section of the Torah and learns to read this section in Hebrew. They also prepare a speech on a topic of their choice. During the ceremony, the young Jew reads the Torah in the Synagogue and delivers their speech to the community.
- The Bar/Bat Mitzvah is a commitment to live according the Mitzvot and become a member of the Jewish community. After the Bar/Bat Mitzvah a Jew is considered ready to take responsibility for living according to the Mitzvot, in the eyes of the community, they are ready to become an adult.
- Today, many young Jewish people choose to “twin” their Bar/Bat Mitzvah with a child who died before being able to celebrate their own coming-of-age.

PASSOVER (PESACH)

- Pesach is the festival that commemorates and remembers the Exodus story.
- Before the festival begins, Jewish families remove all leavened bread (Chametz) from their house. This commemorates the fact that the Israelites had to leave Egypt before their bread had time to rise. During Pesach, Jewish families eat only unleavened bread (Matzah).
- Pesach celebrations include a special meal, called Seder. The Seder plate has five symbolic foods:
 - Maror: bitter herbs and vegetables like horseradish and chard
 - Charoset: a paste made of apples, nuts, and wine
 - Karpas: green leaves like parsley dipped in salt water
 - Zeroa: a roasted lamb shank bone
 - Beitzah: a boiled egg



KEY TERMS

<i>Religious experience</i>	an experience understood by the person having it as an encounter with God, God's power, or God's agents
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KEY TERMS AND SPELLINGS

KEY TERMS 1	DEFINITION	KEY TERMS 2	DEFINITION
<i>Religious experience</i>	an experience understood by the person having it as an encounter with God, God's power, or God's agents (like angels)	<i>10 Commandments (Decalogue)</i>	2 tablets of stone given to Moses by God on the top of Mount Sinai. On them were written 10 things that humans must do if they were to become God's chosen people
<i>Testimony</i>	a form of evidence: someone's description of what they experienced	<i>Promised Land</i>	The land that was given to Abraham and his descendants according to the promise God made
<i>Principle of credulity</i>	Swinburne's idea that we should generally trust what people report unless we have good reason not to	<i>10 Plagues</i>	Sent by God to help persuade the Pharaoh to let the Israelites free from slavery
<i>Defeater</i>	a good reason to doubt someone's testimony (e.g. a reputation for lying, or being in an abnormal state)	<i>Mitzvot</i>	613 rules found in the Torah
<i>Ineffable</i>	impossible, or almost impossible, to put into words (one of William James's four marks)	<i>Temple</i>	The place where the Israelites put the Ark of the Covenant
<i>Noetic</i>	feeling like real knowledge, not just a feeling (one of James's four marks)	<i>Prophet</i>	A messenger from God to humans.
<i>Numinous</i>	Rudolf Otto's word for the feeling of standing before something holy and wholly beyond us	<i>Omnipotence</i>	All-powerful, one of God's traits.
<i>Mysterium tremendum et fascinans</i>	Otto's phrase for the numinous: at once terrifying and irresistibly fascinating	<i>Omnibenevolence</i>	All-loving, one of God's traits.
<i>Veridical</i>	genuinely true or real; a veridical experience is a true perception of something that is really there	<i>Omniscience</i>	All-knowing, one of God's traits.
<i>Temporal lobe</i>	the part of the brain linked, in some studies, to intense religious feelings	<i>Omnipresence</i>	All-present, one of God's traits.
<i>Near-death experience</i>	a vivid experience reported by some people who came close to death, often during cardiac arrest	<i>Kaaba</i>	the shrine in Mecca, rededicated by Muhammad, that is Islam's holiest site
<i>Hallucination</i>	an experience of something that feels real but is not physically present	<i>Caliph</i>	a "successor" who led the Muslim community after Muhammad
	a community of monks or nuns; many became centres of learning and wealth	<i>People of the Book</i>	the Islamic term for Jews and Christians, fellow worshippers of the God of Abraham