



KNOWLEDGE ORGANISERS

NAME:

YEAR 9
HALF TERM 6



What is a knowledge organiser?

A knowledge organiser is a place where your teachers have put all the **core knowledge** that you need to know for a particular topic. They are designed to support you to become self-regulated learners.

It is your first point of reference in lessons to check your understanding. You can use your knowledge organiser to:

- Check your understanding of key vocabulary in a lesson.
- Check your knowledge of a particular topic.
- Self-check quizzing and revision.

A knowledge organiser is **not** everything you are going to learn about a topic; this information will come from your lessons.

How to use your knowledge organiser

In lesson



Unless told otherwise, have your knowledge organiser on the desk, open at the subject you are currently in. This will make it simpler for you to check your understanding of key vocabulary.

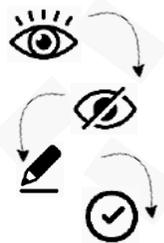


If you are struggling with a knowledge question, refer to your knowledge organiser before asking your teacher. This will also develop your research skills.



When planning your written answers in lessons, refer to your knowledge organiser for that subject to ensure you have correct and detailed knowledge.

As revision



Look-Cover-Write-Check

1. Choose one section of your knowledge organiser.
2. Study it carefully. I find that reading it out works to embed it into memory.
3. Cover the section with a paper, or turn the KO over.
4. Write the sentence/information out from memory.
5. Check it against your KO.



Timeline/diagrams

Use the information from your knowledge organiser and transform it into something else. This can be a timeline, storyboard or diagram.



Self-quizzing

Choose a section of the knowledge organiser you want to learn. Create a set of questions to test yourself with. These can be on flashcards, or even Quizlet. Use the sections of your KO to chunk the knowledge together and make it manageable.

Year 9 Art

Key Vocabulary

Term	Definition
Sketch	A rough or unfinished drawing or painting, often made to assist in making a more finished picture
Proportion	Comparative relation between things or magnitudes as to size, quantity, number
Refine	To add the finishing touches to something or to improve something before it is completely finished.
Composition	The considered layout of a piece of work
Tone	Shade, or shadow
Colour Gradient	Where one colour seamlessly blends into another shade or tone.
Symbolism	the use of symbols to represent ideas or qualities.
Anatomical	Work that shows a scientifically accurate representation of the human body

Overview

During this project students will be studying the work of Leonardo da Vinci and how to create an anatomically correct drawing. Students will discuss how the work of da Vinci helped to advance medicine and doctor's understanding of human anatomy. After this artist study, students will look at how flowers are represented throughout art and will create a floral study using water colour. Students will learn how to create effective colour gradients in water colour. This work will lead into a wider topic of "Day of the Dead" where students will take their anatomical drawing skills and apply this to final piece that features a realistic skull drawing with floral elements. They will learn about the cultural meaning behind the symbolism used in the "Day of the Dead" festival and how they could apply these symbols to create an effective final piece.

Day Of The Dead

The Day of the Dead (Spanish: Día de Muertos or Día de los Muertos) is a Mexican holiday celebrated in Mexico and elsewhere associated with the Catholic celebrations of All Saints' Day and All Souls' Day, and is held on November 1 and 2. The multi-day holiday involves family and friends gathering to pray for and to remember friends and family members who have died. It is commonly portrayed as a day of celebration rather than mourning. People will often dress up in fancy dress and have parades. The term sugar skull is most often applied to edible or decorative skulls made from either sugar or clay that are used in the Mexican celebration of the Day of the Dead. They are created to represent loved ones who have died and offered to the spirits so they will join the living for the celebrations.

How To Create An Accurate Drawing

1. Lightly sketch out the main shapes of your object
2. Sketch out the complete outline and add markings for features.
3. Lightly all the features of your drawing, looking at size and proportions.
4. Add darkest areas of tonal shading and blend out gradually.
5. Add highlights onto the drawing using a rubber.
6. Refine all lines.



Contextual Information

Leonardo da Vinci was an Italian polymath of the High Renaissance who is widely considered one of the most diversely talented individuals ever to have lived. While his fame initially rested on his achievements as a painter, he also became known for his notebooks, in which he made drawings and notes on science and invention; these involve a variety of subjects including anatomy, astronomy, botany, cartography, painting, and palaeontology. Da Vinci spent many years cutting up cadavers in order to have a greater understanding about how the human body and he created anatomically correct sketches of muscles, organs and bones with written notes. These drawings were used by the scientific community in order to further their understanding.



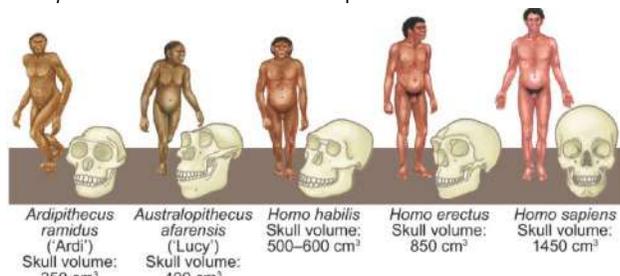
CB4 Natural Selection and Genetic Modification

Key Terms / Words	Definition
Classification	Sorting things into groups.
Evidence for Evolution	The change of inherited characteristics within a population over time through natural selection, which may result in the formation of a new species
Fossil	Remains or impression of a prehistoric plant or animal embedded in rock and preserved in the earth's crust.
Genetic modification	The process of changing the structure of the genes of a living thing in order to make it healthier, stronger, or more useful to humans.
Charles Darwin	English naturalist who studied variation in plants, animals and fossils. Responsible for theory of evolution.
Wallace	Along with Darwin Wallace collected evidence for the theory of evolution.
Selective breeding	when humans breed plants and animals to either select or eliminate particular characteristics.
Natural selection	A process in which an organism is more likely to survive and reproduce than other members of the species because it possesses a certain inherited variation.
Tissue culture	An artificial way to clone plants. It uses tiny pieces from the parent plant to grow them in suitable containers on an artificial nutrient medium under controlled conditions.
Antibiotic resistance	In a population of bacteria, some have evolved to be resistant to antibiotics, making them difficult to destroy. Not completing a course of antibiotics can increase risk of antibiotic resistance.

Fossil Evidence

Scientists use fossils to determine human evolution. They put them in age order. Fossils do not show smooth changes over time because some have not been discovered.

4.4 million old fossilized bones from a female human-like species were discovered in 1992. More fossils were found and named *Ardipithecus ramidus*. The most complete set is named Ardi.

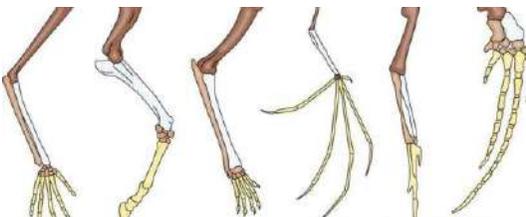


The first significant hominid fossil attributed to Leakey, a robust skull with huge teeth dated to 1.6 million years ago, was found by the Leakey family.

Charles Darwin's theory of **evolution** describes how **natural selection** causes characteristics of species to change over time.

Pentadactyl limb

Many vertebrates have a similar bone structure despite their limbs looking very different on the outside. This structure is known as the pentadactyl (**five fingered**) limb. It suggests that many vertebrates descended from the same common ancestor.



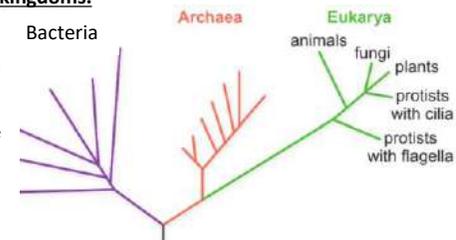
Natural Selection

During the nineteenth century, pollution and soot caused the bark on trees to appear darker. Light-colored moths were no longer **camouflaged** and were eaten by birds. The rare dark moths had a better camouflage.

As a result, dark moths had a greater chance of reproducing and passing on the genes that make them dark. This led to a gradual increase in the proportion of dark moths until light moths became very rare in industrial areas.

Classification of the 3 kingdoms.

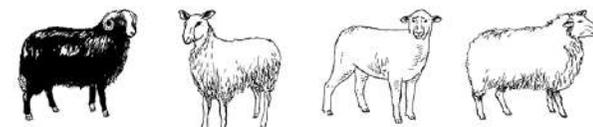
The 5 kingdom system relied on human judgement to compare characteristics of organisms. DNA sequencing of species has challenged this classification system.



... example, DNA sequencing has shown that the red panda is more closely related to the raccoon than to the giant panda. This has led to development of the 3 domain classification system.

Selective Breeding

Selective breeding has been carried out for centuries to either select or eliminate certain characteristics. For example, farm animals have been bred to be hardy in cold climates or to produce better quality meat.



Genetic modification

Also called **genetic engineering**. This process involves moving a gene or genes from one species to another. This is a complicated scientific process which can improve crops and even make bacteria to make medicines like insulin.

Some crops have been genetically modified to be resistant to insects. A bacterium called *Bacillus thuringiensis* naturally produces a toxin which kills many insects. The gene responsible for this has been identified, removed and inserted into crop plants.



CC8 Acids and Alkalis

Acids contain Hydrogen ions, H⁺
Alkalis contain hydroxide ions, OH⁻

pH
Colour of
Universal
Indicator

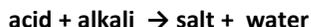
1 2 3 4 5 6 7 8 9 10 11 12 13 14
acidic neutral alkaline
Red orange yellow green purple blue

The common acids that you will come across at GCSE are

Hydrochloric acid HCl
Sulfuric acid H₂SO₄
Nitric acid HNO₃

An indicator is a substance which changes colour in acid or alkali. Universal indicator is not good for doing titrations. You need either Phenol phtalein or methyl orange.

An alkali is a base which is soluble in water. A base is a metal oxide or hydroxide. Bases can neutralise acids to give salt and water only

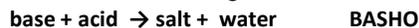


The salt that is made depends on the acid used and the base.

Hydrochloric acid HCl	Makes Chlorides
Sulphuric acid H ₂ SO ₄	Makes Sulphates
Nitric acid HNO ₃	Makes Nitrates

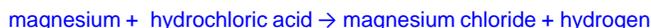
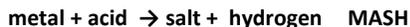
Acid and Base

Bases can neutralise acids to give salt and water only



Acid and metal

Acids react with metals to give hydrogen gas .



Acid and metal carbonate

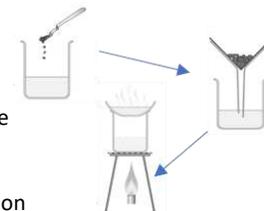
Acids react with metal carbonates to give carbon dioxide gas.



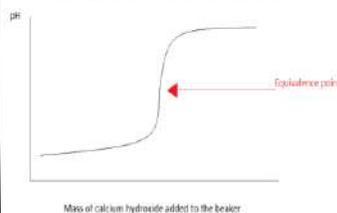
pH Scale

Core Practical Preparing Copper Sulfate

- You can make copper sulphate by reacting copper oxide with sulphuric acid.
1. Add excess base to acid to neutralise all the acid.
 2. Filter off the excess base
 3. Evaporate the water from the solution
 4. Cool to allow crystals of the salt to form.



Core Practical Investigation neutralisation



1. Add 50cm³ dilute hydrochloric acid to a beaker. Record the pH.
2. Add 0.3g calcium hydroxide powder to the beaker.
3. Stir for 30 seconds and measure the pH again.
4. Repeat steps 2-3.
5. Plot a graph of pH against mass of calcium hydroxide added.

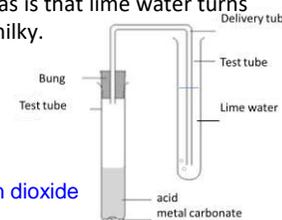
Precipitation Reactions

Salts that are insoluble can be made using precipitation reactions.

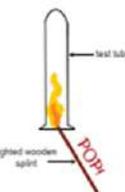
A precipitate is a solid insoluble salt from a precipitation reaction simply mix the two solutions together, filter off the precipitate (salt) and dry.

Soluble in water	Insoluble in water
all common sodium, potassium and ammonium salts	
all nitrates	
most chlorides	silver, lead chlorides
most sulfates	lead, barium, calcium sulfates
sodium, potassium and ammonium carbonates	most carbonates
sodium, potassium and ammonium hydroxides	most hydroxides

The test for carbon dioxide gas is that lime water turns milky.



The test for hydrogen gas is that it makes a squeaky pop when a lit splint is added.





Key people

Russia
(AKA USSR)

Joseph Stalin (1878-1953)

Russian leader and dictator of Russia during the 1930's. He transformed Russia into a one-party totalitarian state whilst rapidly improving industrial production. His reign became known for his 'purges' of enemies of the state.

Vladimir Lenin (1870-1924)

Russian revolutionary who led the Communist Revolution in Russia. He was the first leader of Soviet Russia from 1917-1924. Under his leadership, Russia became a one-party Communist state.

Karl Marx (1818-1883)

A German philosopher and political theorist who wrote *'The Communist Manifesto'* which argued for a uniting of the working class against the ruling class. This work influenced millions of thinkers and contributed to Communist revolutions around the world.

Italy

Benito Mussolini (1883-1945)

Leader and fascist dictator of Italy. Mussolini was known as *"Duce"* and inspired other far-right leaders like Hitler and Franco in Spain. He removed opposition through his secret police and established a one party, totalitarian state by 1927.

Key terms

Communism

A social and economic system whereby nearly all property and resources are collective by a classless society.

dictator

A leader with complete control over a country.

Duce

Title of "The Leader" given to Mussolini.

Fascism

A political system based on one powerful leader, state control, no opposition and pride in race.

Gulag

Prison camps used as a method of punishment in Communist Russia.

NKVD

The People Commissariat for Internal Affairs, the secret police in Russia between 1934-1943.

OVRA

The Organisation for Vigilance and Repression of Anti-Fascism, the Italian secret police.

Totalitarian state

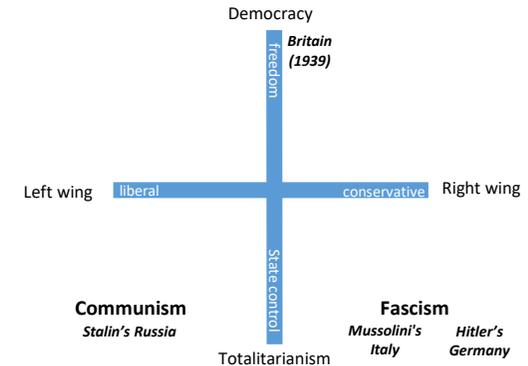
Form of government which attempts to assert total control over the lives of its citizens.

USSR

Union of Soviet Socialist Republics – AKA Soviet Union. Name given to communist Russia.

Key events

Political spectrum



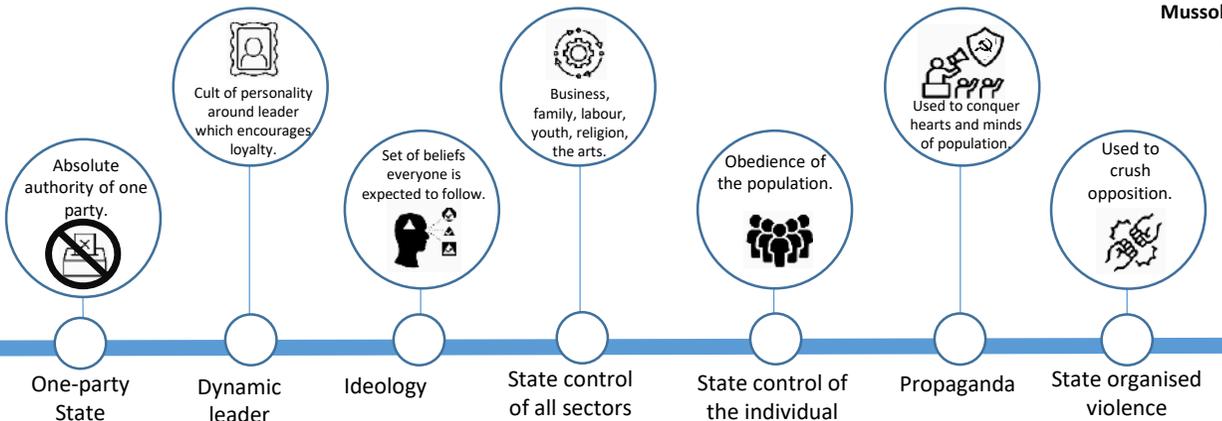
Stalin's Russia

- Russia experienced a Communist revolution in 1917 and the Tsar was overthrown.
- Lenin establishes a Communist state which becomes known as Soviet Russia.
- Upon Lenin's death, Stalin became dictator of Soviet Russia.
- Stalin led a process of industrialisation through his 'Five Year Plans' which meant Russia became a huge industrial nation.
- Clever and consistent use of propaganda meant a cult formed around Stalin as a revered leader.
- There were multiple versions of secret police – these led the Terror against Stalin's enemies.

Mussolini's Italy

- Issues at the end of World War One meant violence became more common across Italy.
- Mussolini is a socialist and becomes named as Prime Minister in 1922. He goes on to be named *"Il Duce"*, dictator of Italy.
- Mussolini establishes a totalitarian fascist state across Italy.
- Fascist Italy inspire other far-right leaders across Europe - Hitler in Germany and Franco in Spain.
- Mussolini wanted to grow Italy's empire to lead to the second Roman Empire.
- A cult of personality developed around Mussolini
- In 1925, Italy became a one-party state where the OVRA arrested any enemies of the state.

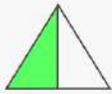
Seven features of a totalitarian state



Prior Knowledge

Higher Maths

A **unit fraction** is a rational number written as a **fraction** where the numerator is one and the denominator is a positive integer.



$\frac{1}{2}$



$\frac{1}{4}$



$\frac{1}{7}$



$\frac{1}{16}$

B (brackets)

I indices²

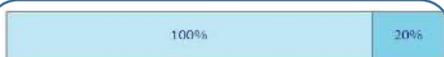
D ÷ division

M multiplication x

A + addition

S subtraction -

To get the **reciprocal** of a number, we divide 1 by the number.

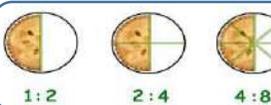
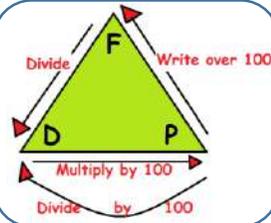


$$120\% = \frac{120}{100} = 1.20$$

The **multiplier** is the **single** decimal value used to multiply the amount you are working with. Firstly, consider what the overall percentage would be after the figure has had its percentage increase or decrease added or subtracted. Then convert this amount to a decimal, before finally multiplying by the number in question.

Ratios can be fully **simplified** just like fractions. To **simplify a ratio**, divide all of the numbers in the **ratio** by the highest common factor.

Two **ratios** that have the same value are called **equivalent ratios**. To find an **equivalent ratio**, multiply or divide both quantities by the same number.



$$\frac{3}{5} \quad 2 \frac{3}{5} \quad \frac{5}{3}$$

Proper fraction

Mixed fraction

Improper fraction

Types of fractions

Proportions

A proportion is an equality of ratios:

$$\frac{a}{b} = \frac{c}{d}$$

Key Concepts

Higher – Unit 4 - Fractions, Ratio and Percentages

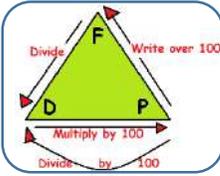
Reciprocal	The reciprocal of a number is 1 divided by the number.	$\frac{1}{n}$ or n^{-1}
Unit Ratios	One part of the ratio is 1. Unit ratios make them easier to compare.	1:n or n:1
Appreciate	In financial terms means to gain value.	
Depreciate	In financial terms means to lose value.	
VAT (Value Added Tax)	VAT is tax charged at 20% on most goods and services.	
Ratio	A comparison of two or more quantities.	
Simplifying Ratios	Divide all of the numbers in the ratio by the highest common factor.	
Equivalent Ratios	Multiply or divide both quantities by the same number.	
Recurring Decimals	A decimal representation of a number whose digits are periodic (repeating its values at regular intervals).	0.66666... or 0.54545454...
Direct Proportion	As one amount increases, another amount increases at the same rate.	
Inverse Operations	They are the operation that reverses the effect of another operation .	Add \leftrightarrow Subtract Multiply \leftrightarrow Divide Square \leftrightarrow Square Root Cube \leftrightarrow Cube Root
Per Annum	Each year.	E.g. income per annum is amount earned each year.

Prior Knowledge

Higher Maths



Higher – Unit 5 – Angles and Trigonometry



Angles in a triangle add to 180° .

Angles in a quadrilateral add to 360° .

An **Interior Angle** is an angle inside a shape.

The **Exterior Angle** is the angle between any side of a shape, and a line extended from the next side.

Number of Sides	Polygon Name
3	triangle
4	quadrilateral
5	pentagon
6	hexagon
7	heptagon
8	octagon
9	nonagon
10	decagon
12	dodecagon
n	n-gon

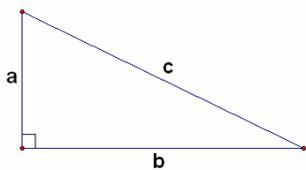
Acute Triangle All three angles are acute (less than 90°). 	Equilateral Triangle All three sides are congruent (same size).
Right Triangle One of the angles is a right angle (90°). 	Isosceles Triangle Two sides are congruent (same size).
Obtuse Triangle One of the angles is an obtuse angle (180°). 	Scalene Triangle No sides are congruent (same size).

Acute Angle Less than 90° 	Right Angle Exactly 90° 	Obtuse Angle Greater than 90° but less than 180°
Straight Angle Exactly 180° 	Reflex Angle 	Full Rotation Exactly 360°

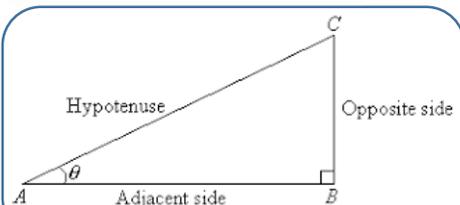
Types of Quadrilateral

square 4 right angles 4 equal sides Opposite sides are parallel All sides the same length 	rhombus 0 right angles 4 equal sides Opposite sides are parallel All sides the same length 	kite 0 right angles 2 sets of equal sides No sides are parallel 2 pairs of sides the same length
rectangle 4 right angles 4 equal sides Opposite sides are parallel Opposite sides the same length 	parallelogram 0 right angles 2 sets of equal sides Opposite sides are parallel Opposite sides the same length 	trapezium 0 right angles 2 sets of equal sides 1 set of sides are parallel sides can be any length

Pythagoras' Theorem



$$a^2 + b^2 = c^2$$



Perfect Squares

a perfect square is a product of two equal integers

$$2 \cdot 2 = 4 \quad 3 \cdot 3 = 9 \quad 6 \cdot 6 = 36$$

$$2^2 = 4 \quad 3^2 = 9 \quad 6^2 = 36$$

Sum of Interior Angles	Total sum of angles inside a polygon (n is the number of sides)	$(n - 2) \times 180$
Tessellation	Shapes fit together. The angles where the shapes meet must add up to 360° .	
Interior Angle	An angle inside a shape.	
Exterior Angle	The angle between any side of a shape, and a line extended from the next side.	
Pythagoras' Theorem	Used to find missing lengths in a right-angled triangle. The square of the hypotenuse is equal to the sum of the squares of the other two sides.	$a^2 + b^2 = c^2$
Angle of Depression	Angle measured downwards from the horizontal.	
Angle of Elevation	Angle measured upwards from the horizontal.	
Hypotenuse	The side opposite the right angle.	
Opposite	The side opposite the angle θ .	
Adjacent	The side next to the angle θ .	
Sine	Ratio of the opposite side to the hypotenuse.	$\sin(\theta) = \frac{opp}{hyp}$
Cosine	Ratio of the adjacent side to the hypotenuse.	$\cos(\theta) = \frac{adj}{hyp}$
Tangent	Ratio of the opposite side to the adjacent side.	$\tan(\theta) = \frac{opp}{adj}$
Sin⁻¹	Inverse sine function, used to find missing angles.	$\theta = \sin^{-1} \frac{opposite}{hypotenuse}$
Cos⁻¹	Inverse cosine function, used to find missing angles.	$\theta = \cos^{-1} \frac{adjacent}{hypotenuse}$
Tan⁻¹	Inverse tangent function, used to find missing angles.	$\theta = \tan^{-1} \frac{opposite}{adjacent}$

Prior Knowledge

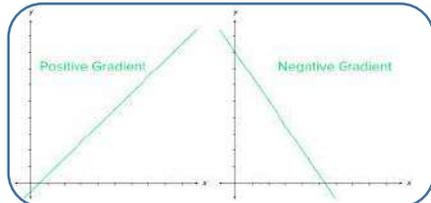
Higher Maths

The equation of a straight line is given by $y=mx+c$.

Horizontal lines have the equation $y=$ ___
Vertical lines have the equation $x=$ ___

$$y = mx + c$$

gradient y-intersect

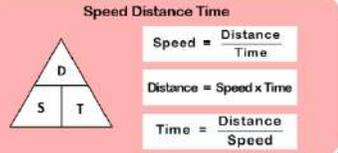


Parallel lines are lines in the same plane that never intersect. They are always the same distance apart.

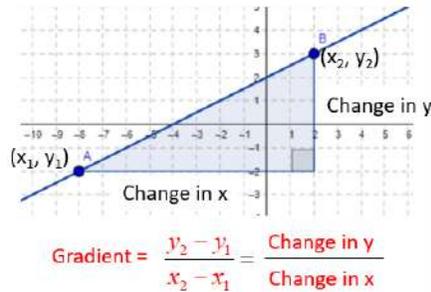
Perpendicular lines are lines that meet at a right angle, that is, at an angle that measures 90°.

A table of values is used to calculate the y value by substituting the x value into the equation.

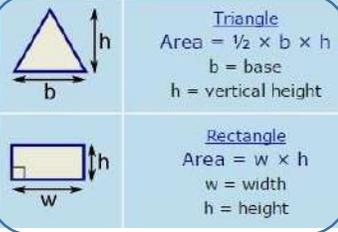
x	$y = 2x+3$	y	(x,y)
-3	$y = 2(-3)+3$	-3	(-3,-3)
-2	$y = 2(-2)+3$	-1	(-2,-1)
-1	$y = 2(-1)+3$	1	(-1,1)
0	$y = 2(0)+3$	3	(0,3)
1	$y = 2(1)+3$	5	(1,5)
2	$y = 2(2)+3$	7	(2,7)
3	$y = 2(3)+3$	9	(3,9)



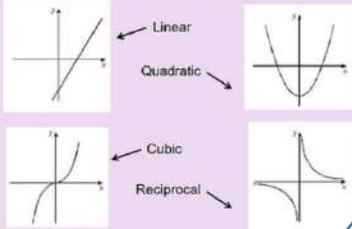
Gradient of a Straight Line



A quadratic expression is an **expression** that has a variable that's squared and no variables with powers higher than 2 in any of the terms.



Types of Graphs



Key Concepts

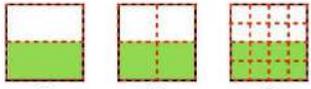
Higher – Unit 6 – Graphs

Linear Equation	Generates a straight-line (linear) graph. The equation for a straight line graph is written as $y=mx+c$.	$y = mx + c$ gradient y-intersect
Linear Function	Has a graph that is a straight line,	
Velocity	Speed in a particular direction.	Velocity "speed in a given direction"
Velocity-Time Graph	Shows how velocity changes over time.	
Line Segment	Section of a line.	
Midpoint of a line segment	The point exactly in the middle.	
Perpendicular	Lines which cross at 90° The product of the two gradients is -1. When a graph has gradient m, the perpendicular gradient is $-1/m$	
Quadratic Equation	Contains a term in x^2 but no higher or negative power of x. The graph is a curve called a parabola .	$ax^2 + bx + c = 0$ A General Quadratic Equation
Quadratic Function	Has a graph which is a parabola.	
Minimum / maximum point	A quadratic graph has a point where the graph turns.	
Solutions	A quadratic equation can have 0, 1 or 2 solutions. A cubic equation can have 1, 2 or 3 solutions.	
Cubic Function	Contains a term in x^3 but no higher power of x. It can also have terms in x^2 and x, and number terms.	 $2x^3 + x^2 - 13x + 6 = 0$
Reciprocal Function	In the form k/x (where k is a number). The x and y axes are asymptotes to the curve.	 Horizontal Asymptote Vertical Asymptote
Asymptote	A line that the graph gets very close to but never actually touches.	
Equation of a circle	With a centre (0,0) and radius r, the equation of a circle is $x^2 + y^2 = r^2$	 $x^2 + y^2 = r^2$

Prior Knowledge Foundation Maths

1000 grams = 1 kilogram

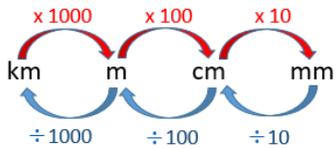
To simplify a fraction, divide the numerator and denominator by the greatest common factor.



$$\frac{1}{2} = \frac{2}{4} = \frac{8}{16}$$

$$1 \div 2 = 0.5 \quad 2 \div 4 = 0.5 \quad 8 \div 16 = 0.5$$

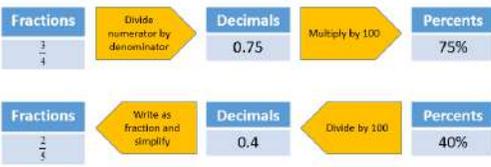
Converting Metric Lengths



Percentage of a quantity:
Find 1% by dividing by 100, then multiply by required percentage.
OR use combinations of 10% (divide by 10) and 1% (divide by 100) to find required amount.

1 million = 1,000,000

Convert Fractions, Decimals and Percents

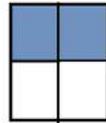


Multiply a Whole # by a Fraction
Multiply **numerator** by **whole number**
The **denominator** stays the same

$$a + b = b + a$$

$$xy = yx$$

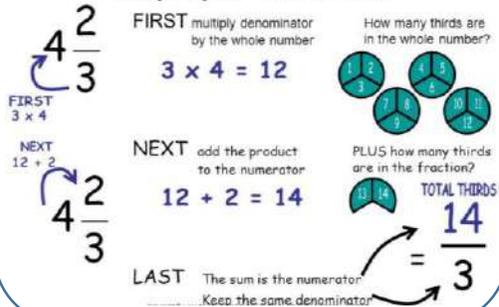
2 ← Numerator - How many parts you have
vinculum
4 ← Denominator - How many total parts there are



the **LCM** of two (or more) integers is the **smallest positive multiple they share**

Multiples of 4: ...-8, -4, 0, 4, 8, 12, 16...
Multiples of 6: ...-18, -12, -6, 0, 6, 12, 18...
LCM: 12

Convert Mixed Numbers to Improper Fractions



MULTIPLYING FRACTIONS BY WHOLE NUMBERS

STEP ONE: $\frac{2}{7} \times \frac{3}{1} = \frac{2 \times 3}{7 \times 1} = \frac{6}{7}$

STEP TWO: $\frac{2}{7} \times 3 = \frac{2 \times 3}{7} = \frac{6}{7}$

STEP THREE: $\frac{2}{7} \times 3 = \frac{6}{7}$

To add or subtract fractions, they must have the same denominators. Use the LCM to find equivalent fractions with the same denominator.

Key Concepts

Foundation – Unit 4 – Fractions and Percentages

Comparing Fractions	To compare fractions, write them with the same denominator then compare numerators.	Compare $\frac{3}{4}$ & $\frac{2}{3}$ The LCM of 3 and 4 is 12 $\frac{3 \times 3}{4 \times 3} = \frac{9}{12}$ $\frac{2 \times 4}{3 \times 4} = \frac{8}{12}$ $\frac{9}{12} > \frac{8}{12}$
Multiply Fractions	Multiply the numerators and multiply the denominators.	$\frac{2}{3} \times \frac{1}{5} = \frac{2 \times 1}{3 \times 5} = \frac{2}{15}$
Add or Subtract Fractions	Write them with a common denominator then add or subtract the numerators.	$\frac{2}{3} + \frac{1}{9} = \frac{6}{9} + \frac{1}{9} = \frac{7}{9}$ Work out $\frac{1}{3}$ of 40. $\frac{1}{3}$ of 40 = $\frac{1}{3} \times 40 = \frac{40}{3} = 40 \div 3 = 13 \frac{1}{3}$ $\frac{1}{3}$ of 40 = $3 \times 8 = 24$
Fraction of an Amount	Divide by the denominator, multiply by the numerator.	
Unit Fraction	A unit fraction has a numerator of 1.	$\frac{1}{2}$ The reciprocal of 2 (or $\frac{2}{1}$) is $\frac{1}{2}$.
Reciprocal	The reciprocal of a fraction is the "upside down" fraction.	$0.723 = \frac{723}{1000}$
Decimal to a fraction	The denominator is the smallest place value.	$\frac{6}{20} = \frac{30}{100} = 30\%$
Fraction to a percentage	Convert the fraction to one with the denominator of 100, then the numerator is the percentage.	
Deposit	First payment towards the cost of something.	Deposit + balance = total
Balance	The remaining amount which is owing after a deposit.	
Increase by a percentage	Work out the increase and add to the original number.	10% of 30 = 3 30 + 3 = 33
Decrease by a percentage	Work out the decrease and subtract from the original number.	20% of 40 = 8 40 - 8 = 32
VAT (Value Added Tax)	VAT is tax charged at 20% on most goods and services.	VALUE ADDED TAX

Prior Knowledge Foundation Maths

Inverse operations are opposite **operations**. They are the **operation** that reverses the effect of another **operation**.

Substitution means putting numbers in place of letters to calculate the value of an expression.

Work out the value of the expression

$$5x + y$$

If $x = 4$ and $y = 3$

$$5 \times 4 + 3$$

$$20 + 3$$

$$23$$

To work out the **term to term rule**, give the starting number of the sequence and then describe the pattern of the numbers.

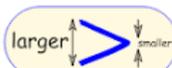
Expand brackets: multiply each term inside the bracket by the term outside.

Expanding Brackets

$$7(x + 2)$$

$$7x + 14$$

Equality and Inequality



$=$ equal
 \neq not equal
 $>$ greater than
 $<$ less than
 \geq greater than or equal
 \leq less than or equal

To solve a single step equation, use the inverse operation and a balancing method.

$$8a - 5 = 11$$

$$+5 \quad +5$$

$$8a = 16$$

$$+8 \quad +8$$

$$a = 2$$

Arithmetic sequences are where terms increase (or decrease) by a fixed number (common difference).

$$-6, 1, 8, 15, 22$$

+7 +7 +7 +7

Simplify algebraic expressions: collect like terms (terms with the same variable).

$$4x + 8 + 3x + 7 = 7x + 15$$

Multiply terms

$$4a^2 \times 2a^5$$

Multiply Numbers Add Powers

$$= 8a^7$$

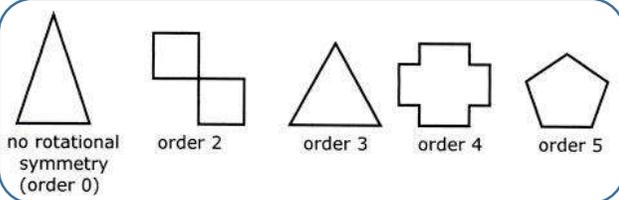


Foundation – Unit 5 – Equations, Inequalities and Sequences

Subject	The subject of a formula is the letter on its own on one side of the equals sign.	In $t = y + 4$, t is the subject.
Equation	Contains an unknown number (a letter) and an = sign.	$2x + 3 = 8$ Variable
Solve an equation	Work out the value of the unknown number by using inverse operations.	$\frac{x}{12} - 5 = 4$ $+5 \quad +5$ $\times 12 \quad \frac{x}{12} = 9 \times 12$ $x = 108$
Solve an inequality	Solve in the same way as a linear equation: use inverse operations to work out the unknown value.	$x - 18 > -5$ $x - 18 + 18 > -5 + 18$ $x > 13$
Substitution	Replace values in a formula to solve the resulting equation.	$x + \frac{x}{2}$ $x = 5$ $5 + \frac{5}{2}$
Formula	Shows the relationship between two or more variables (letters).	Speed = distance \div time
Sequence	Pattern of numbers or shapes that follows a rule.	3, 5, 7, 9, ... 1st term 2nd term 3rd term 4th term three dots means goes on forever (infinite) ("term", "element" or "member" mean the same thing)
Term	The numbers in a sequence.	
Term-to-term rule	Describes how to get from one term to the next.	9, 13, 17, 21, 25, 29 term to term rule: add 4
Arithmetic Sequence	Goes up or down in equal steps of a common difference. Term-to-term rule is add or subtract.	-6, 1, 8, 15, 22 +7 +7 +7 +7
Geometric Sequence	The term-to-term rule is multiply or divide by a number.	2, 4, 8, 16, 32 $\times 2 \quad \times 2 \quad \times 2 \quad \times 2$

Prior Knowledge Foundation Maths

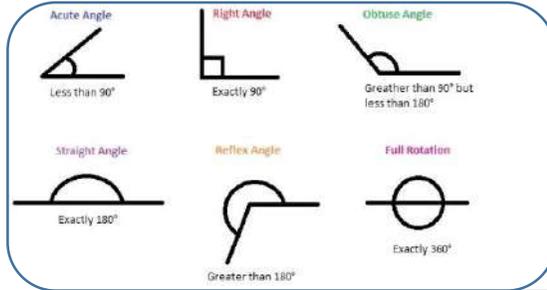
An object's degree of **rotational symmetry** is the number of distinct orientations in which it looks exactly the same for each **rotation**.



Number of Sides	Polygon Name
3	triangle
4	quadrilateral
5	pentagon
6	hexagon
7	heptagon
8	octagon
9	nonagon
10	decagon
12	dodecagon
n	n-gon

An **Interior Angle** is an angle inside a shape.

The **Exterior Angle** is the angle between any side of a shape, and a line extended from the next side.



Acute Triangle All three angles are acute (less than 90°). 	Equilateral Triangle All three sides are congruent (same size).
Right Triangle One of the angles is a right angle (90°). 	Isosceles Triangle Two sides are congruent (same size).
Obtuse Triangle One of the angles is an obtuse angle (180°). 	Scalene Triangle No sides are congruent (same size).

Types of Quadrilateral

square 4 right angles 4 equal sides Opposite sides are parallel All sides the same length	rhombus 0 right angles 4 equal sides Opposite sides are parallel All sides the same length	kite 0 right angles 2 sets of equal sides No sides are parallel 2 pairs of sides the same length
rectangle 4 right angles 4 equal sides Opposite sides are parallel Opposite sides the same length	parallelogram 0 right angles 2 sets of equal sides Opposite sides are parallel Opposite sides the same length	trapezium 0 right angles 2 sets of equal sides 1 set of sides are parallel sides can be any length

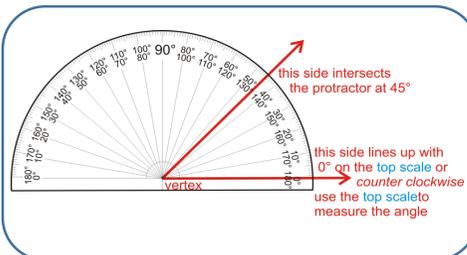
Angles in a triangle add to 180°.

Angles in a quadrilateral add to 360°.

Parallel lines are lines in the same plane that never intersect. They are always the same distance apart.



Perpendicular lines are lines that meet at a right angle, that is, at an angle that measures 90°.



Foundation – Unit 6 - Angles

Congruent Shapes	Exact same shape and size, but reflected, rotated or translated.	SIMILAR VS CONGRUENT
Similar Shapes	Same shape but enlarged (bigger or smaller). Sides are in the same ratios.	
Polygon	2-dimensional shape bound by straight sides.	Examples: poly-gon many - corners Non-examples:
Regular Polygon	All equal side lengths and all equal angles.	
Irregular Polygon	Unequal side lengths and unequal angles.	
Tessellation	Shapes fitting together. For shapes to tessellate, all angles at the point where the shapes meet must add to 360°.	
Angle sum	Sum of the interior angles of a polygon.	Sum = (sides – 2) x 180
Interior Angle	An Interior Angle is an angle inside a shape.	
Exterior Angle	The Exterior Angle is the angle between any side of a shape, and a line extended from the next side.	
Straight Line	Angles on a straight line add up to 180°.	Angles add up to 180°: Angles don't add up to 180°:

Section A: Glaciated landscapes in the UK



EROSION + WEATHERING

Erosion	Rock are broken down and transported e.g. abrasion and plucking
Abrasion	Sandpaper effect of glaciers load
Plucking	Glacier freezing round are ripping out rocks
Weathering	Rocks are broken down 'in situ' e.g. freeze-thaw
Freeze-thaw	Repeated freezing and expansion of water breaking rock down



MOVEMENT + TRANSPORT

Flow	Glaciers flow like a frozen river
Rotational Slip	Glaciers rotate within hollows to steepen back wall and deepen hollow into corrie
Subglacial material	Material frozen in a glacier
Bulldozing	Glacier pushes material, moraine, in front of its snout as it moves



DEPOSITION

Moraine / Till	Unsorted material deposited by glacier so will be unsorted.
Outwash	Material deposited by outwash streams so will be sorted.

UPLAND GLACIATED AREA

Lake District	Example of an upland glaciated area in the UK
Social Impact	Impact on people and their possessions e.g. congestion lengthening journey times due to tourists.
Economic Impact	Impact on economy e.g. money made from tourists spending money locally
Environmental Impact	Impact on environment such as footpath erosion



FEATURES OF EROSION

Corrie	Armchair shaped hollow often with a tarn - Nethermost Cove
Arête	Thin + steep ridge formed as two corries erode back – Striding Edge
Pyramidal Peak	Pointed mountain formed as three, or more, corries erode back - Helvellyn
Truncated Spur	Cliff edges on valley side where interlocking spurs have been ripped off - Grisedale
Glacial trough / U-shaped valley	Wide flat valley with steep sides, U- shaped.
Ribbon Lake	Long thin lakes where softer rock has been eroded more - Windermere
Hanging Valley	Smaller valley high above glacial trough formed as tributary valley wasn't eroded as deeply.



FEATURES OF DEPOSITION

Lateral moraine	Glacial deposit at the side of the valley
Medial moraine	Glacial deposit down the middle of a valley
Terminal moraine	Glacial deposit at the glacial snout
Ground moraine	Glacial deposit all over the valley floor
Drumlin	Elongated hills made from moraine with steep stoss slope and gentle lee slope
Erratic	Rocks deposited out of place by glacier.
Lake District example	Langdale shows examples of erratics and moraine. Swarms of drumlins are found in Swindale

Food Poisoning

Main Bacteria:

Salmonella, E-Coli, Campylobacter, Staphylococcus Aurous, Clostridium Botulinum.

Key Symptoms

Nausea, vomiting, diarrhoea, stomach pain, fever, tiredness, loss of appetite.

Onset Time

From consumption to first symptom.
Different for each bacteria - can range from a few hours to a few days.

Vulnerable groups (risk of serious illness)

Elderly, young children, pregnant women, immune compromised individuals

Religious dietary rules

Islam	Meat must be halal Fast during Ramadan No pork or alcohol allowed
Judaism	Abide by Kosher rules and slaughter. Meat and dairy must be avoided together
Buddhism	Mainly vegetarian Avoids alcohol Some fast between noon and sunrise of the following day
Sikhism	Mainly vegetarian Do not overindulge – eat only what is required. Not allowed other religiously slaughtered meat
Christianity	No strict rules – some denominations do however Lot of symbolism with food – blood (wine) and body (bread) of Christ

Terminology

- Food poisoning
- Contamination
- Religious diets
- Factory farming
- Food poverty
- Food bank
- Halal
- Kosher
- Free-range
- Organic
- Bacteria
- Onset time

Food Poverty

Where an individual is unable to obtain or buy food and maintain good health

Food bank usage over the last 5 years



Types of factory farming

Battery Farming	Large barns, no natural light, short life span, crowded conditions. Increased incidence of death and disease. Cheaper meat
RSPCA Assured	Large barns, less crowded, access to better food, access to stimulation, less disease and death. Slightly longer lifespan
Free Range	Access to outside, medical care, better food, far less crowded, longer life span, more expensive
Free Range Organic	Same as free range but not given antibiotics for health and given organic food.



Key terms

Atonement	Paying off the debt of sin/ making up for something
Crucifixion	A Roman method of punishment/ the way Jesus was killed
Denomination	A type of Christian IE Catholic/Protestant/Baptist/Methodist/ Pentecostal
Eucharist	Holy Communion that has become the actual body and blood of Jesus through transubstantiation
Genesis	The first book of the Bible. Includes Creation and Adam and Eve
Messiah	The anointed one who came to save
Grace	The idea that God loves us even though we don't deserve it
Ministry	When Jesus performed miracles and taught people through parables
Nativity	The who birth story of Jesus in including the annunciation through Gabriel and the incarnation
Incarnation	When God became flesh (Jesus)
Salvation	Being saved from sin (can be done through grace of the law of God)
Trinity	The idea that God is 3 persons in 1 (Father, Son and Spirit). Consubstantial (one substance)
Eternal	Has no beginning or end
Omnibenevolent	God is all loving
Personal	God wants us to have a personal relationship with him
Judgement Day	The day when our bodies will be raised up and God will send us to heaven, hell or purgatory
Resurrection	When Jesus came back to life
Immanent	God is with us 'here and now'
Transcendent	God is beyond time and space and existed before it

Key teachings

The Nativity

This is the birth story of Jesus which is made up of the Prophecy (of Isaiah), the Annunciation (of Gabriel to Mary) and the Incarnation (where Jesus was born).

The Ministry of Jesus

After his baptism in the river Jordan, Jesus did parables to teach people how God wanted them to live and performed miracles as a sign he was part of the Trinity (The Son of God). His teachings and 37 miracles are recorded in the Gospels (Matthew, Mark, Luke & John).

The

Crucifixion Before Pilate and Herod, Jesus was killed on a cross. He died to pay for sin (atonement) and he fixed our relationship with God. This was shown through the Temple Curtain tearing from 'top to bottom' (Gospels). This happened on 'Good Friday.'

The Resurrection

On the 3rd Day of Easter (Easter Sunday), Jesus rose from the dead. Over the next 40 days he appeared to his disciples in different places such as on the Road to Emmaus, at the Tomb and on Lake Tiberius.

The Ascension

On the 40th Day of Easter, Jesus ascended from the Mt. of Olives. He said 'Go and make disciples of all nations.' This instruction is called the Great Commission.

Pentecost

On the 50th Day of Easter the Holy Spirit 'came upon' the disciples in the Upper Room like a 'rushing wind.' They gained the ability to speak different languages and perform miracles. They convinced people of Christianity and baptised 3000 people that very day.

Afterlife

Most Christians believe that, on Judgement Day, we will all be judged on our actions and sent to heaven or hell. Catholics also believe in Purgatory which is a temporary state where the individual endures 'purifying fire' (Catechism), pays off their sin and then reaches heaven.

The Nature of God

His nature means 'what he is like.' In Christianity this includes omniscient, omnipotent, omnibenevolent, transcendent, eternal, 3 in one (Trinity), a just judge, imminent and personal.

Key Quotes

Book of John (Bible)

'In the beginning was the word...the word was God...through him all things were made.'

Genesis

God made the world in '7 days' ex nihilo.
'Let there be light'
Creation is God's 'handiwork'
'The Spirit of God hovered over the water'
God 'walked in the Garden' (of Eden) with Adam and Eve.

Exodus

'Do not lie' Ten Commandments.
Moses saw God as the 'Burning Bush.'
Moses Saw the back of God on Mt. Sinai- God 'passed before' Moses.

Jesus

Hell is the 'gnashing of teeth' and the 'lake of fire'.
'love your neighbour as yourself' (Greatest Commandment/ Good Samaritan)
'Now you are in torment' (Lazarus and the Rich Man).
'Today you will be with me in paradise' (Jesus to the Penitent Thief).

St Paul

At the Rapture we will be 'snatched away.'

Drama

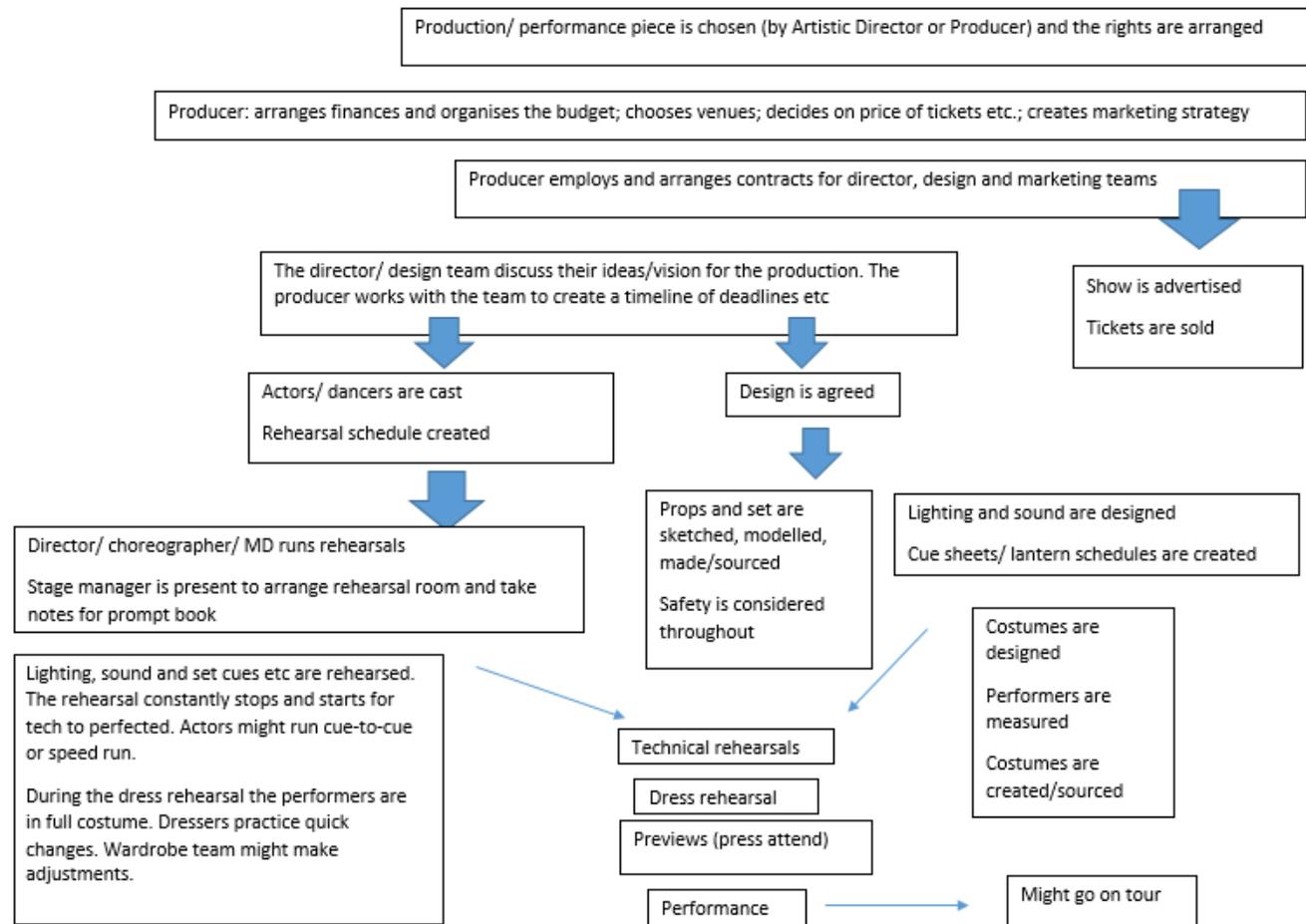
Features of Kneehigh's work:

Adaptation
Archetypical characters
Chorus
Inventive use of props
Physical theatre
Puppetry
Dance
Song/music
Audience interaction
Pre-show
Multirole
Comedy

Kneehigh's beliefs:

You don't have to perform in conventional theatres
The script is only a starting point
Everyone contributes to rehearsals
Use the skills and talents of your company
Produce work for non-theatre goers
The work should be relevant to modern issues

Production flowchart:



Databases

KEY VOCABULARY	
Database	Large collection of data. Can be on paper or computerised.
Field	Single piece of data about a person or an object.
Record	All of the data about a person or an object.
Table	Contains a set of database records.
Query	A search result based on specific criteria.
Form	User-friendly way to enter data into a database.
Validation	Check to see what has been entered is allowable.
Data Type	Tells the database how you want the data to be stored.
Primary Key	Field within a database which enables every record to be uniquely identified.

Data types

Type	Description	Example
Number	Can be positive, negative and decimals	2.56 (Average number of thefts)
Currency	Number including monetary values	£2.00 (Price)
Boolean	Value that can either be true or false	Yes (Do you have food allergies)
Auto number	Generates a unique number	14526 (Student ID Number)
Date and time	Date and times in different formats	05/06/10 (Student Date of Birth)

Advantages and Disadvantages of computerised databases

Advantages:

- Easy to make backup copies.
- Changes are updated automatically.
- Easy to sort data into order e.g. alphabetically
- Search 1000s of records quickly

Disadvantages:

- Can be difficult to set up. You may have to get a professional to make it.
- Can be accessed and changed illegally (hack)
- You need to have a computer.

Real world examples



Patient Records



Pupil Data

Online product list

amazon



Police database

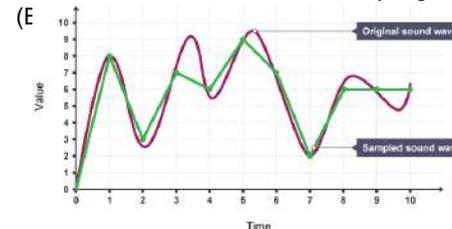
Data Representation II

KEY VOCABULARY	
<i>Audio</i>	
Analogue	Continuous data that can have a range of values.
Digital	Information that can be stored as discrete numbers (E.g., Binary 0s and 1s).
Sample	Digital representation of an analogue signal.
Sample rate	How many samples are taken per second.
Bit rate	The number of bits stored per second.
Compression	Reducing the size of a file.
<i>Visual</i>	
Bit	Smallest amount of data a computer can store.
Pixel	Short for Picture Element. Is the smallest individual square that can be displayed on a screen.
Resolution	The number of pixels that can be displayed in a given area of the screen.
Meta Tag (Data)	Extra information that is contain in the image file. e.g. the date the photo was taken.
Colour Depth	The number of colours used in an image.
RGB	Short for Red, Green and Brown. The main colour pallet used in digital images.
Hexadecimal	Number system used to store pixel colour data.

Knowledge

Audio

Sampling is the process of taking measurements of an analogue sound wave at regular intervals. These measurements can then be stored as a series of binary digits



Source:

<https://bam.files.bbci.co.uk/bam/live/content/zyg72hv/large>

If these measurements are taken more frequently, this will result in a more accurate representation of the original analogue sound wave. However, this will also lead to larger files sizes as more bits will need to be stored.

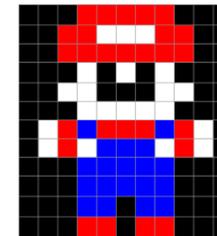
Bit Rate is a measure of how much data is processed for each second of sound.

Bit Rates for **MP3** files range from 16 kilobytes per second (kbps) to 320 kbps.

Visual

Representing images in digital format

Digital pictures are formed out of individual pixels (*picture elements*), just like the Greek and Roman mosaics are formed out of individual pieces of glass or stone. However, unlike their ancient counterparts, the elements in digital pictures are aligned in rows and columns, with the colour of each element represented as a sequence of binary digits.



```

1111111010101010111111
111110100000010101111
1111101010101010101111
111110011001100111111
11100001111100001111
1111100000000111111
1100100110101001100011
1100100001010100100011
111110101010101111111
111110101010101111111
111110101101011111111
111111010110101111111

```

Resolution

Is the number of pixels displayed on a screen. The more pixels that can be displayed, the better the picture quality. **4K resolution**, at least the way most TV companies define it, is 3840 x 2160 pixels, or 2160p. That means the screen will have approx. 8 million pixels.

Components of fitness

Muscular strength

Speed

Flexibility
Power

Balance

Agility

Long jump

Run up

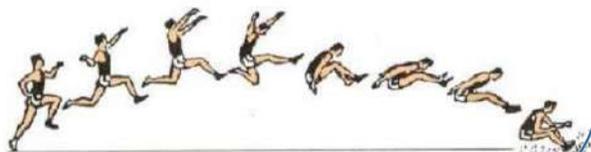
- Athlete accelerates onto the take off board, aiming to be close to maximum speed at take off.

Take off

- Take off on one leg as close to the line as possible.
- Maintain this take off position for as long as possible.
- As the athlete comes into land, bring both legs in front of body.

Rules

- No part of the athletes foot should cross the front edge of the foul line.



Shot putt

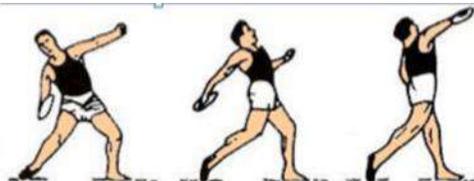
- Rest the shot on your **palm** and push into your neck
- Ensure your chin, knee and toe are in line
- Punch shot away from the neck
- Keep elbow high

Rules:

The shot must be released above the height of the shoulder with one hand

Discus

- Your throwing hand (including the thumb) is on top of the discus with your fingers evenly spread.
- The top knuckle of your four fingers (not the thumb) should touch the rim, with your fingertips over the sides
- Ensure your chin, knee and toe are in line
- Shift your weight forward as you pivot your hips.
- The discus should leave your hand smoothly off the index finger with your hand at about shoulder height.
- Follow through, rotating to your left to remain in the ring and avoid fouling (if right handed).



High jump

Run up

- Run on a curve leaning away from the bar.
- Use approximately 6-12 steps on approach.

Take off (Fosbury flop)

- On take off, point foot towards the far corner of the landing area.
- Drive knees upwards on the leg closest to the bar.
- Rotate hips so you are facing away from the bar.
- Reach arm up and over.
- Arch back and bring legs together.
- Lift feet over and land on back, tucking chin to chest.

Rules

- Take off on one foot only.
- Do not touch the bar.



English: Macbeth William Shakespeare

Macbeth	Eponymous protagonist, ambitious, ruthless
Lady Macbeth	Defies expectations, strong and ambitious
Witches	Supernatural beings, prophecy, could represent conscience.
Banquo	Macbeth's friend, sons prophesized to rule, killed and returns as a ghost.
Duncan	Great King, loves Macbeth at the start, gets killed in Act 2
Macduff	Wife and children killed, vengeful, kills Macbeth, born by caesarean.

KEY QUOTES

Unnatural	Lady M "Come you spirits...Unsex me here"
Hallucination	Macbeth "Is this a dagger I see before me?"
Cyclical	Macbeth "Blood will have blood".
Guilt / Anxiety	Lady Macbeth: "All the perfumes of Arabia will not sweeten this little hand".
Betrayal of prophecy	Macbeth "I bear a charmed life".

PLOT:

ACT 1:	Macbeth and Banquo meet the witches, Cawdor executed, Lady Macbeth reads letter and taunts Macbeth, Duncan arrives.
ACT 2:	Macbeth kills Duncan, Macbeth is crowned, Malcolm flees.
ACT 3:	Banquo suspects Macbeth, Banquo murdered, Fleance escapes, Macbeth is haunted by Banquo at a banquet.
ACT 4:	Witches show Macbeth future Kings – sons of Banquo, Macduff's family murdered.
ACT 5:	Lady Macbeth goes mad and sleepwalks, Lady Macbeth dies, Macbeth is killed by Macduff and Malcolm is crowned King.

MOTIFS: Write down key quotes that match the motifs.

- Nature:**
- Light and Dark:**
- Children:**
- Blood:**
- Sleep:**
- Dreams:**

THEMES: Tick them off when you have seen them in the play.		
Fate and free will:	Is the action pre decided?	<input type="checkbox"/>
Ambition	The Macbeths' ambition drives the play.	<input type="checkbox"/>
Appearance and reality	People and events are not always what they seem.	<input type="checkbox"/>
Supernatural	Witches, ghosts, prophecies.	<input type="checkbox"/>
Violence	Many battles throughout the play.	<input type="checkbox"/>

KS3 DT

Health and safety

Apron	Keep clean and reduce impact of something coming into you.
Goggles	Protect your eyes when using machines.
Hazard lines	Only one person to be in front of these yellow lines when operating the machine.
Ear defenders	Protect your hearing from using loud machines.
Bags in the rack	To avoid others tripping over them.
Ties and jewellery tucked away	Ensuring they don't get caught in tools.
Long hair in a hair band	Avoid it getting caught in machines.
No running	Avoid trips and falls and maintain a calm environment.
Question	Ask before using machines. Any questions, if in doubt - DON'T

Marking and measuring out tools

Sharp pencil	To make a mark.
Metal rule	Used to measure.
Tri square	Producing parallel lines.

Key steps in the design process

Key steps in the design process	Definition
Design brief	What the purpose of your project is, in brief.
Specification	The specific details that your end product must adhere to
Quality control	The process of checking the quality of the work as you progress through the project

Word	Definition
Colour	The property possessed by an object which produces different sensations on the eye as a result of the way it reflects or emits light.
Materials	The matter from which a product is or can be made.
Texture	The feel, appearance, or consistency of a surface or a substance.
Components	A part or element of a larger product, especially as part of a machine or vehicle.
Target Market	A particular group of consumers at which a product or service is aimed.
Aesthetics	The look, taste, feel, and smell of a product or material.
Form	The visible shape of a product.
Function	The purpose and use of a product.
Ergonomics	Ergonomics is about how easy a product is to use. It should be comfortable to use and the person should like using the product.
Anthropometrics	Anthropometrics is used to make sure that the product is the correct size and proportions to suit the needs of the user.

ACCESS FM

A AESTHETICS

WHERE DID THE DESIGNER GET THEIR INSPIRATION? COULD THE PRODUCT LOOK BETTER?

DO YOU THINK IT LOOKS ATTRACTIVE OR UGLY, WHY?

WHAT DOES THE PRODUCT LOOK LIKE? THINK SHAPE, FORM, MATERIALS, SIZE, BEAUTY, UGLINESS



C COST

IS IT AFFORDABLE TO YOUR CUSTOMER? WILL IT MAKE A PROFIT?

IS IT VALUE FOR MONEY?

HOW MUCH DOES IT COST?



C CUSTOMER

WHAT IMPACT WOULD IT HAVE ON A CUSTOMERS LIFE?

WHY WOULD A CUSTOMER BUY IT? WHAT MAKES IT SUITABLE FOR THEM?

WHO WOULD BUY IT? WHO WOULD USE IT?



E ENVIRONMENT

WHAT IS THE PRODUCTS IMPACT ON THE ENVIRONMENT? THINK BATTERIES, RETHINK, REFUSE, REDUCE, REUSE, RECYCLE, LIFE-CYCLE

HOW WOULD THE PRODUCT BE DISPOSED OF?

IS THE PRODUCT NEEDED OR WANTED? HOW LONG WILL IT LAST?



S SAFETY

IS THE PRODUCT HIGH QUALITY? DOES IT MEET SAFETY STANDARDS?

HOW HAS THE DESIGNER CONSIDERED SAFETY?

COULD THE PRODUCT HURT ANYONE? ARE THERE ANY SHARP EDGES?



S SIZE

IS IT AN APPROPRIATE SIZE? WOULD IT WORK BETTER IF IT WAS BIGGER OR SMALLER?

DOES IT COME IN DIFFERENT SIZES?

HOW BIG IS IT?



F FUNCTION

DOES THE PRODUCT WORK? COULD THE PRODUCT WORK BETTER?

HOW DOES THE PRODUCT WORK? WHY IS THE PRODUCT NEEDED?

WHAT DOES THE PRODUCT DO? IS IT EASY TO USE?

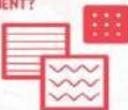


M MATERIALS

WHAT IMPACT COULD THE DESIGNERS CHOICE OF MATERIAL HAVE ON THE ENVIRONMENT?

WOULD A DIFFERENT MATERIAL MAKE IT BETTER?

WHAT MATERIAL HAS IT BEEN MADE FROM?



1. ¿Tiene una habitación libre? / En el hotel

Do you have a room available? / In the hotel



Quiero –
I want

Me gustaría / Quisiera reservar –
I would like to reserve



una habitación doble – a double room

una habitación individual – a single room



con baño – with a bath
con ducha – with a shower
con balcón – with a balcony
con aire acondicionado – with air conditioning
con pensión completa – with full board
con media pensión – with half board
con vistas al mar – with sea views
con cama de matrimonio – with a double bed
con dos camas – with two beds
con conexión a internet – with internet connection

para una* noche – for a/one night
para una* semana – for a/one week
para quince días – for a fortnight

para dos* personas – for two people
para una familia de... – for a family of...



¡ESCUCHA! - SCAN ME FOR PRONUNCIATION.



SCAN ME

**¡OJO! – Use a different number to change the people/time.*

2. ¿Adónde vas de vacaciones normalmente?

Where do you usually go on holiday?



Suelo ir...-
I usually go...

Solemos ir... -
We usually go...

Normalmente voy... -
I normally go

Vamos... -
We go...

a - to

España – Spain
Gales - Wales
Francia – France
Escocia – Scotland
Italia – Italy
Irlanda – Ireland
Grecia – Greece
los Estados Unidos – USA
Portugal – Portugal
Alemania – Germany
Turquía – Turkey



con mi familia – with my family
con mis padres – with my parents
con mis amigos – with my friends
solo/sola – by myself



y - and

viajo en... –
I travel by...

viajamos en... –
we travel by...



avión – plane
autocar – coach
tren – train
coche – car
barco – boat
moto – motorbike



3. ¿Qué te gusta hacer durante las vacaciones?

What do you like to do on holiday?



Quando estoy de vacaciones, me gusta... –
When I am on holiday, I like...

Quando estoy de vacaciones, suelo... –
When I am on holiday, I usually...

visitar monumentos – visit monuments
nadar – to swim
sacar fotos – to take photos
esquiar – to ski
ir de excursión – to go on a day trip
tomar el sol – to sunbathe
montar en bicicleta – to go on a bike ride
descansar – to relax
ver lugares de interés – see places of interest
ir al parque temático – to go to a theme park
ir al parque acuático – to go to a water park
hacer deportes acuáticos – to do watersports



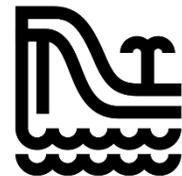
dado que – because

porque – because

visto que – because

es – it is

divertido – fun
entretenido – entertaining
relajante – relaxing
activo – active
interesante – interesting



4. ¿Adónde fuiste de vacaciones el año pasado?

Where did you go on holiday last year?



El año pasado – Last year

El verano pasado – Last summer

El invierno pasado – Last winter

Hace seis meses* – Six months ago

fui a/en... - I went to/by
fuimos a/en... - We went to/by
me alojé en... - I stayed in..
nos alojamos en... - we stayed in

y – and

visité monumentos – I visited monuments
bailé – I danced
fui de excursión – I went on a trip
jugué al voleibol en la playa – I played volleyball on the beach
nadé en el mar/ en la piscina – I swam in the sea/ in the pool
descansé – I relaxed
esquíé – I skied
saqué fotos – I took photos
tomé el sol – I sunbathed

Lo pasé... - It was/I had a...time...-



bien – good
regular – okay/nothing special
fenomenal – phenomenal/wonderful
genial – great
bastante bien – quite good
mal – rubbish
aburrido – boring

**¡OJO!* – Use a different time amount and quantity to change the meaning.



5. ¿Adónde te gustaría ir este año?

Where would you like to go this year?

Este verano – this summer
En julio* – In July
**¡OJO!* – Change the month or season.



espero... - I hope to...
me gustaría – I would like to...
quiero – I want to...
tengo la intención de – I intend to...
voy a – I'm going to...



ir a – to go to
ir con – to go go with

quedarme en – to stay in

+ Activities from the list in Section 3

+Locations and people from Section 2

un hotel de lujo – a luxury hotel
un albergue – a hostel
una pensión – a B+B
un parador – a parador



CC8 Acids and Alkalis

Acids contain Hydrogen ions, H⁺
Alkalis contain hydroxide ions, OH⁻

pH
Colour of
Universal
Indicator

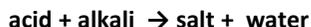
1 2 3 4 5 6 7 8 9 10 11 12 13 14
acidic neutral alkaline
Red orange yellow green purple blue

The common acids that you will come across at GCSE are

Hydrochloric acid HCl
Sulfuric acid H₂SO₄
Nitric acid HNO₃

An indicator is a substance which changes colour in acid or alkali. Universal indicator is not good for doing titrations. You need either Phenol phthalein or methyl orange.

An alkali is a base which is soluble in water. A base is a metal oxide or hydroxide. Bases can neutralise acids to give salt and water only

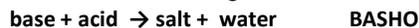


The salt that is made depends on the acid used and the base.

Hydrochloric acid HCl	Makes Chlorides
Sulphuric acid H ₂ SO ₄	Makes Sulphates
Nitric acid HNO ₃	Makes Nitrates

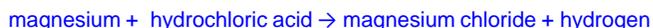
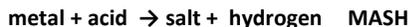
Acid and Base

Bases can neutralise acids to give salt and water only



Acid and metal

Acids react with metals to give hydrogen gas .



Acid and metal carbonate

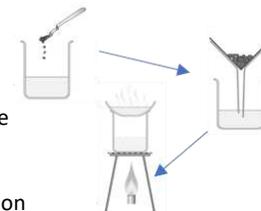
Acids react with metal carbonates to give carbon dioxide gas.



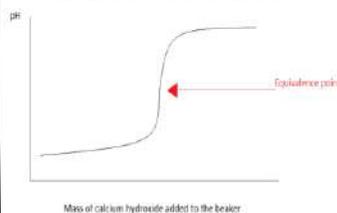
pH Scale

Core Practical Preparing Copper Sulfate

- You can make copper sulphate by reacting copper oxide with sulphuric acid.
1. Add excess base to acid to neutralise all the acid.
 2. Filter off the excess base
 3. Evaporate the water from the solution
 4. Cool to allow crystals of the salt to form.



Core Practical Investigation neutralisation



1. Add 50cm³ dilute hydrochloric acid to a beaker. Record the pH.
2. Add 0.3g calcium hydroxide powder to the beaker.
3. Stir for 30 seconds and measure the pH again.
4. Repeat steps 2-3.
5. Plot a graph of pH against mass of calcium hydroxide added.

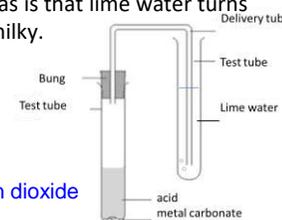
Precipitation Reactions

Salts that are insoluble can be made using precipitation reactions.

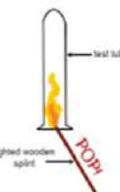
A precipitate is a solid insoluble salt from a precipitation reaction simply mix the two solutions together, filter off the precipitate (salt) and dry.

Soluble in water	Insoluble in water
all common sodium, potassium and ammonium salts	
all nitrates	
most chlorides	silver, lead chlorides
most sulfates	lead, barium, calcium sulfates
sodium, potassium and ammonium carbonates	most carbonates
sodium, potassium and ammonium hydroxides	most hydroxides

The test for carbon dioxide gas is that lime water turns milky.



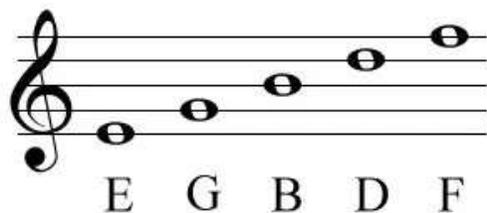
The test for hydrogen gas is that it makes a squeaky pop when a lit splint is added.



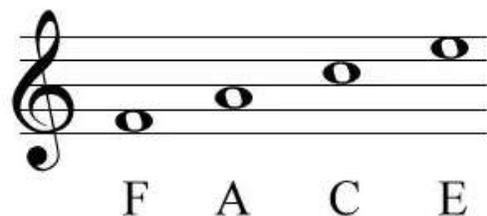
Terminology

- Bar & bar lines
- Notation
- Stave
- Ledger lines
- Accuracy
- Fluency
- Tempo
- Beat
- Time signature
- Rhythm
- Melody
- Phrasing
- Sequence
- Pitch
- Instrumentation
- Structure
- Harmony
- Chords
- Style
- Genre

Stave Notation - Treble Clef



Every Green Bus Drives Fast



FACE in the spaces

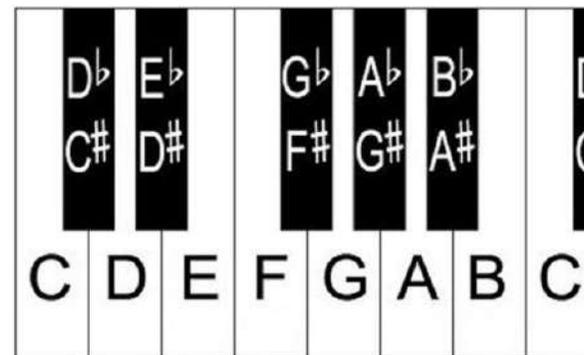
How to build a chord

Use the 1st, 3rd and 5th notes of the scale to build a basic chord.

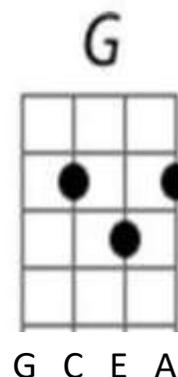
Example: **A B C D E F G**

A minor chord = A C E

Keyboard Diagram



Ukulele chord diagram



Guitar chord diagram

