

ASPIRATION ~ INTEGRITY ~ RESPECT



KNOWLEDGE ORGANISER

CYCLE 1

YEAR 9





ENGLISH

Year 9 Cycle 1 - English

My Voice: The Short Story

Over the cycle we will be reading and writing a variety of diverse short stories. We will consider the 5 story structures and how the stories that we have studied over the year fit within these definitions. This is a great opportunity for your creative voice to be heard.

Jacob Ross' 5 story structures...	
Remember, some stories will belong to more than one of these categories!	
Classic stories - A brave but vulnerable character suffers difficult experiences - They eventually overcome the 'baddie' or evil force <i>Hint: common examples are fairytales</i>	Encounter stories - Protagonist is confronted by something new which disrupts their everyday routine - Something important and unexpected is now at stake
The isolated moment - Usually a very short, intense experience which has a major impact on the character involved e.g. love, grief, betrayal, joy, seeing something for the first time...	Self/realisation stories - Focuses on the inner drama of a character - They are confronted with a dramatic situation, but end by learning something new about themselves or others - The character may have undergone a journey or transformation by the end
Parabolic stories - A short story which uses symbolism to portray an overall message, lesson or hidden meaning - Often this is like a puzzle which needs to be interpreted and discussed to be 'solved'	

Voice Techniques

First person

Second person

Third person

Perspective

Tense

Definitions

If a story has a first person narrator it is told by one person at a time. They will use the first person pronoun to tell their story.

This is an unusual form of narrating where 'you' are placed at the centre of the action. You become a character and are directly involved.

A third person narrative is a story where the narrator seems to be on the outside looking in at their characters. They describe events as if witnessing them but are not involved.

Whose 'point of view' are we seeing the narrative through? Are the reliable?

Are you telling it in past tense (He ran), present tense (He runs/He is running) or future tense (He will run...He will be running)?

Traditional narrative structure



Alliteration
Colour
Onomatopoeia
Metaphor
Personification

Adjectives & Adverbs
Senses
Similes



Year 9 Cycle 1 - English

Vocabulary	Definitions
Parabolic	Writing that is designed to teach a moral or spiritual lesson.
Symbolism	The use of objects, characters, colours, or events to represent ideas and concepts beyond their literal meaning.
Protagonist	A main character in a story.
Narrative	A story or structured account or description of a series of connected events, whether factual or fictional.
Genre	A particular type or style of literature.
Atmosphere	The character, feeling, or mood of a place or situation.
Pathetic Fallacy	When the character's mood is reflected in the weather.
Medias Res	A narrative technique where a story opens midway through the plot, rather than at the beginning.
Tension	The feeling of anticipation, unease, or emotional strain that keeps readers engaged.
Climax	The point of a narrative where tension and drama reach their absolute peak.
Resolution	The final part of a story's plot where the main conflict is solved and lingering questions are answered.
Structure	The overarching framework of a text, referring to how its elements (such as plot, character, and setting) are organized and ordered.
SHOW NOT TELL : a technique that will help you write in a more descriptive way. It creates a picture or image in the reader's mind by showing instead of telling the reader about: • Characters' thoughts or feelings • The action that's taking place • The setting Example: • Tell = I was happy • Show = I skipped home, humming a tune.	

MATHS

KPI 9.01 Decimals Manipulation

1) Multiplying decimals	1) Remove the decimal points. 2) Multiply. 3) Insert the same number of decimal points in the answer as in the question. 0.5×0.3 $5 \times 3 = 15$ $0.5 \times 0.3 = 0.15$	2) Dividing a decimal by an integer	$0.72 \div 6$ 0.12_1 $6 \overline{) 0.72}$	$0.972 \div 8$ 0.1215 $8 \overline{) 0.9720}$
		3) Dividing an integer by a decimal	1) Write as a fraction. 2) Form an equivalent fraction. 3) Divide.	

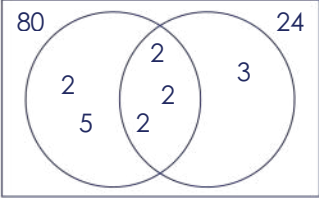
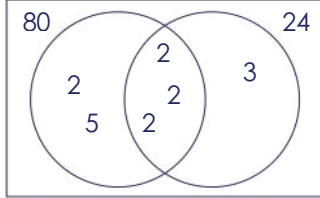
KPI 9.02 Estimation and Limits of Accuracy

1) $\approx$	"approximately equal to"	2) Truncation	Ignoring all decimal places past a certain point without rounding.
3) Significant figures	The total number of digits in a number, not counting the zeros at the beginning of a number or at the end of a decimal number. 345 000 has 6 significant figures. 0.3047 has 4 significant figures.	4) Estimate	Find approximate answer by calculating with numbers rounded to one significant figure.
5) Error Intervals	The range of values (between the upper and lower bounds) in which the precise value could be. least possible value $\leq x <$ greatest possible value		

KPI 9.03 Related Calculations

$19 \times 18 = 342$ $19 \times 180 = 3420$ $190 \times 18 = 3420$ $190 \times 180 = 34200$ $1900 \times 180 = 342000$	$108 \div 9 = 12$ $1080 \div 9 = 120$ $108 \div 90 = 1.2$ $108 \div 0.9 = 120$ $108 \div 0.09 = 1200$
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KPI 9.04 HCF and LCM of Large Numbers

1) Prime numbers	A prime number has two distinct factors; 1 and itself. 2 is the only even prime number. 1 is not a prime number. The first ten prime numbers are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29		
2) Factor	Any whole number that divides exactly into another number leaving no remainder. Factors of 20 are: 1, 2, 4, 5, 10, 20	3) Multiple	The result of multiplying a number with a whole number. (times tables!) The multiples of 7: 7, 14, 21, 28, 35, 42, 49, 56, 63, 70 ...
4) HCF-Venn diagram	 HCF of 80 and 24 = $2 \times 2 \times 2 = 8$	5) LCM-Venn diagram	 LCM of 80 and 24 = $2 \times 2 \times 2 \times 2 \times 3 \times 5 = 240$

KPI 9.05 Fraction Calculations

1) Writing one number as a fraction of another	Write £15 as a fraction of £25. $\frac{15}{25} = \frac{3}{5}$	2) Reciprocal	Reciprocal of 7 $\rightarrow \frac{1}{7}$ Reciprocal of $\frac{2}{3} \rightarrow \frac{3}{2}$
3) Fractions of an amount	Divide the amount by the denominator and then multiply the result by the numerator.		
4) Add/Subtract fractions	Make the denominators the same (find the LCM). Use equivalent fractions to change each fraction to the common denominator. Add/subtract the numerators only.	$\frac{2}{7} + \frac{2}{5} = \frac{10}{35} + \frac{14}{35} = \frac{24}{35}$	
5) Multiplying fractions	Multiply the numerators. Multiply the denominators. Simplify where possible.	$\frac{4}{5} \times \frac{3}{8} = \frac{12}{40} = \frac{3}{10}$	
6) Dividing fractions	Keep the first fraction the same. Change the second to its reciprocal. Multiply the fractions. Simplify/convert to mixed number where possible.	$\frac{4}{5} \div \frac{3}{8} = \frac{4}{5} \times \frac{8}{3} = \frac{32}{15} = 2 \frac{2}{15}$	

KPI 9.06 Algebraic Manipulation

1) $2a$	$2 \times a$	2) ab	$a \times b$
3) a^2	$a \times a$	4) $3a^2$	$3 \times a \times a$
5) a subtracted from b	$b - a$ $a_$	6) a less than b	$b - a$ $b_$
7) a divided by b	$\frac{b}{a}$ $a_$	8) b divided by a	$\frac{a}{b}$ $4 \times a$
9) 4 times smaller than a	$\frac{a}{4}$ or $a \div 4$	10) 4 times larger than a	$\rightarrow 4a$
11) 5th power of a	a^5	12) Variable	A letter used to represent any number.
13) Coefficient	The number to the left of the variable. This is the value that we multiply the variable by. $4x \rightarrow$ The coefficient of x is 4. $x \rightarrow$ The coefficient of x is 1.	14) Term	A single number, variable or numbers and variables multiplied together.
15) Simplifying	An expression can be simplified by grouping like terms. E.g. $2a + b^2 - 4b + 7a = 9a + b^2 - 4b$	16) Identity	An identity is an equation which is always true no matter what value of the unknown is substituted. E.g. $3x - 15 = 3(x - 5)$

KPI 9.07 Index Laws

1) Multiplication law	$a^m \times a^n = a^{m+n}$ Same base numbers, ADD the powers.	2) Division law	$a^m \div a^n = a^{m-n}$ Same base numbers, SUBTRACT the powers.
3) Power to a power	$(a^m)^n = a^{m \times n}$ MULTIPLY the powers.	4) Raising a fraction by a power	$(ab)^n = a^n \times b^n$ Raise each number or variable to the same power.
5) Power of 0	$a^0 = 1$. Any number or variable to the power of zero equals 1.	6) Negative powers (integers)	$a^{-1} = \frac{1}{a}$ $a^{-2} = \frac{1}{a^2}$ $a^{-n} = \frac{1}{a^n}$ A negative power represents the reciprocal.
7) Positive unit fractions	$a^{\frac{1}{2}} = \sqrt{a}$ $a^{\frac{1}{3}} = \sqrt[3]{a}$ $a^{\frac{1}{n}} = \sqrt[n]{a}$	8) Negative unit fractions	$a^{-\frac{1}{2}} = \frac{1}{\sqrt{a}}$ $a^{-\frac{1}{3}} = \frac{1}{\sqrt[3]{a}}$ $a^{-\frac{1}{n}} = \frac{1}{\sqrt[n]{a}}$
9) Positive non-unit fractions	$a^{\frac{m}{n}} = (\sqrt[n]{a})^m$	10) Negative non-unit fractions	$(a)^{-\frac{m}{n}} = \left(\frac{1}{a}\right)^{\frac{m}{n}} = \left(\sqrt[n]{\frac{1}{a}}\right)^m$

9.08 Standard Form

1) Rule	Numbers written in standard form are always written in the form $a \times 10^n$, where $0 < a < 10$	2) Powers of 10	$10^1 = 10$ $10^2 = 100$ $10^3 = 1000$ $10^4 = 10\,000$ $10^5 = 100\,000$ etc.	$10^{-1} = \frac{1}{10} = 0.1$ $10^{-2} = \frac{1}{100} = 0.01$ $10^{-3} = \frac{1}{1000} = 0.001$	$10^{-4} = \frac{1}{10000} = 0.0001$ etc
3) Ordinary to Standard Form	$340000 = 3.4 \times 10^5$ $0.00903 = 9.03 \times 10^{-3}$	4) Standard Form to Ordinary	$1.09 \times 10^3 = 1090$ $8.77 \times 10^{-6} = 0.00000877$		

KPI 9.09 Expanding and Factorising 2

1) Expand	Multiply out the bracket(s) in the expression. E.g. $3(5x + 7) = 15x + 21$	2) Factorise	Identify the HCF and rewrite the expression with brackets. E.g. $6x^2 + 9x = 3x(2x+3)$.											
3) Expanding double brackets	Writing two brackets next to each other means the brackets need to be multiplied together. $(x + 1)(x + 2) = (x + 1) \times (x + 2) = x^2 + 3x + 2$ Note: $(x + a)^2 = (x + a)(x + a)$		<table><tr><td>x</td><td>x</td><td>+1</td></tr><tr><td>x</td><td>x²</td><td>+x</td></tr><tr><td>+2</td><td>+2x</td><td>+2</td></tr></table>			x	x	+1	x	x ²	+x	+2	+2x	+2
x	x	+1												
x	x ²	+x												
+2	+2x	+2												
4) Factorising quadratics	To factorise a quadratic, put it back into a pair of brackets. To find the terms that go in each bracket, look for a pair of numbers which multiply to give the constant and add together to give the coefficient of x													
5) Difference of two squares (DOTS)	$a^2 - b^2 = (a+b)(a - b)$	E.g. $x^2 - 16 = (x + 4)(x - 4)$												

KPI 9.10 Forming Expressions and Substitution

1) Substitution	Replace a variable with a given value.	2) Function machine	Shows the relationship between two variables, the input and the output.
3) Formula	A mathematical relationship or rule expressed in symbols.		
4) Expression	A mathematical statement which contains one or more terms combined with addition and/or subtraction signs.		

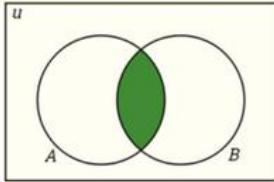
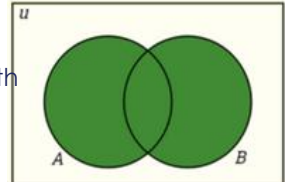
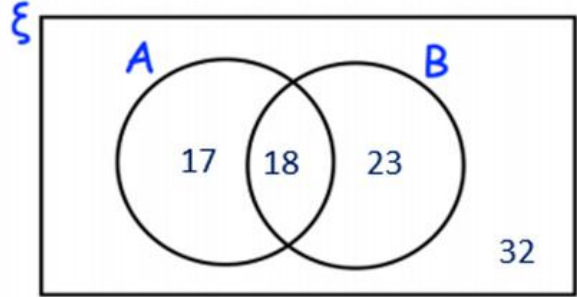
KPI 9.11 Direct and inverse proportion

1) Direct proportion	A relationship between two variables where, as one increases, the other also increases.	3) Unitary method	To find the value of one unit first.
2) Inverse Proportion	A relationship between two variables where, as one increases, the other decreases.	4) Exchange rate	Tells us how much of one currency you can exchange for another currency e.g. £1 = \$1.39

KPI 9.12 Probability 1

1) Probability	How likely something is going to happen. All probabilities must be given as a fraction, decimal or a percentage (NOT a ratio).	2) Probability scale words	Impossible, Unlikely, Even chance, Likely, Certain																												
3) Probability scale	All probabilities exist between 0 and 1. Impossible = 0, Even chance = ½ and certain = 1 Impossible Unlikely Even Chance Likely Certain 0 1	4) Systematic listing	The outcomes for an event can be listed in an organised or systematic way to make sure that none of the possible outcomes are missed out.																												
5) Single event probability	The sum of the probabilities of a set of outcomes must equal one.	6) Probability notation	In probability we use the notation P(____) to represent the probability of something happening.																												
7) Probability of an event happening	$P(\text{of an outcome happening}) = \frac{\text{number of the desired outcome}}{\text{total number of outcomes of the event}}$	8) Mutually exclusive	Are events that cannot happen at the same time.																												
9) Expected outcomes	You need to multiply the probability by the total number of trials.	10) Frequency trees	Is used to record and organise information given as frequencies. This can then be used to calculate probabilities.																												
11) Sample space	Listing all of the possible outcomes from two events in a table. E.g. Displaying all of the scores for the sum of two spinners. Spinner A (1,2,3,4) and Spinner B (2,3,4) <table><tr><td colspan="2"></td><td colspan="4">Spinner A</td></tr><tr><td colspan="2">+</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td rowspan="3">Spinner B</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr></table>			Spinner A				+		1	2	3	4	Spinner B	2	3	4	5	6	3	4	5	6	7	4	5	6	7	8	12) Relative frequency	Relative frequency is used when probability is being estimated using the outcomes of an experiment or trial, when theoretical probability cannot be used. Relative frequency or experimental probability is calculated from the number of times an event happens, divided by the total number of trials in an actual experiment. Relative Frequency = $\frac{\text{No. of Successful Outcomes}}{\text{No. of Trials}}$
		Spinner A																													
+		1	2	3	4																										
Spinner B	2	3	4	5	6																										
	3	4	5	6	7																										
	4	5	6	7	8																										

KPI 9.12 Probability 1

13) Venn Diagrams	A Venn diagram shows the relationship between groups of different outcomes.	14) Element	A list of numbers, objects or outcomes.
15) Universal set	Contains all of the elements for our question	16) Set Notation	A – all elements in A A' – all elements NOT in A B – all elements in B B' – all elements NOT in B
17) Intersection	$A \cap B$ – all the elements in both A and B 	18) Union	$A \cup B$ – all the elements in A or B or both 
19) Finding probabilities from a Venn diagram	Venn diagrams can be useful for organising information about frequencies and probabilities. We can then use them to solve conditional probability problems. E.g. The following Venn diagram shows information about the number of members of a local sport club who take part in the Archery and Badminton classes. A person is chosen at random. Find $P(B \text{ only})$ $= \frac{18 + 23}{17 + 18 + 23 + 32} = \frac{41}{90}$ 		

KPI 9.13 Solving Equations 2

1) Solve	Use inverse operations to find the solution of an equation.	2) Linear equation	Contains an equals sign (=) and has one unknown. E.g. $5x - 2 = 2x + 7$
3) Equation	An equation is a statement with an equal sign, stating that two expressions are equal in value.		

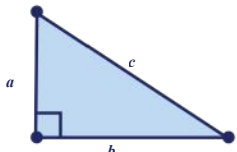
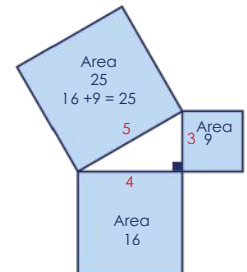
KPI 9.14 Inequalities 1

1) Representing an inequality on a number line – closed circle	A closed circle is used to show greater than or equal to (or less than or equal to) the number. $x \geq 3$ 	2) Representing an inequality on a number line – open circle	An open circle is used to show greater than (or less than) the number. $x > 3$ 
3) Reversing the inequality	Multiplying or dividing both sides by a negative number reverses the inequality E.g. $-3x < 6$ $x > -2$		

KPI 9.15 Sequences

1) Sequence	A pattern of numbers which fit a certain rule.	2) Term	A number in a sequence.
3) Term to term rule	The rule for how to get from one number to the next number in the sequence.	4) Position	Where a term is in a sequence.
5) Position to term rule	The rule for how to work out a number in a sequence if you know its position.	6) Nth term	Used to find a term in a sequence given its position e.g. $5n + 3$
7) Linear sequence	The terms increase or decrease by the same amount each time. Also known as an arithmetic sequence. Nth term is written in the form, $an + b$.	9) Geometric sequence	A geometric sequence goes from one term to the next by always multiplying or dividing by the same value.
10) Fibonacci sequence	The Fibonacci sequence is unique because the next term is found by adding up the two previous terms. 1, 1, 2, 3, 5, 8, 13, 21...		

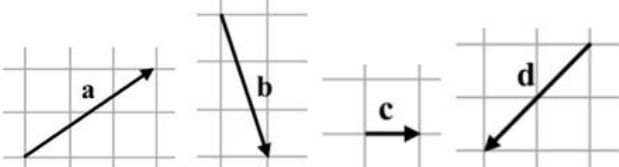
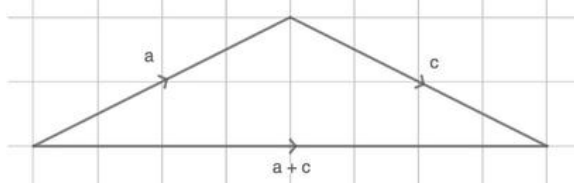
KPI 9.16 Pythagoras

1) Right-angled triangle	A triangle that contains a right-angle (90 degrees).	2) Hypotenuse	The longest side – opposite the right-angle.
3) Pythagoras' Theorem	For any right-angled triangle, the area of the square of the longer length (the hypotenuse) is equal to the area of the squares of the shorter lengths added together.  $c^2 = a^2 + b^2$ $a^2 = c^2 - b^2$ $b^2 = c^2 - a^2$		
			

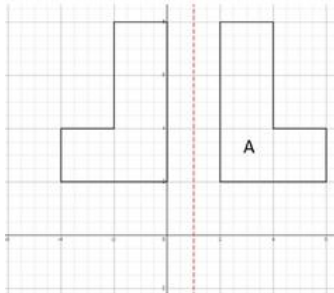
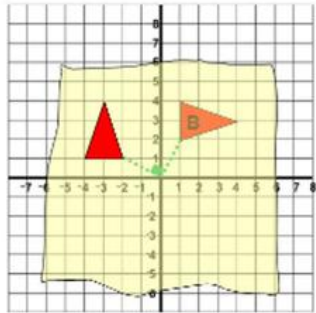
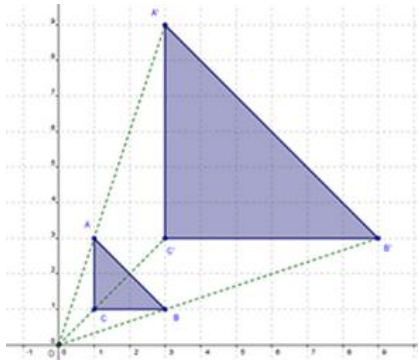
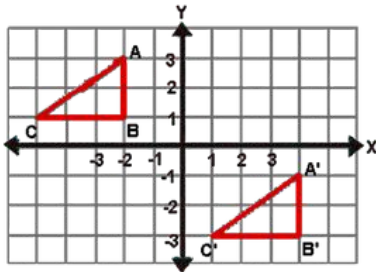
KPI 9.17 Interior and Exterior Angles

1) Polygon	A polygon is a two-dimensional shape with 3 or more straight sides. A polygon is either regular or irregular: Regular – side lengths are equal, and all angles are equal. Irregular – side lengths are unequal, and angles are unequal.		
2) 3 sides 4)	Triangle	3) 4 sides	Quadrilateral
5 sides 6) 7	Pentagon	5) 6 sides 7)	Hexagon
sides 8) 9	Heptagon	8 sides 9)	Octagon
sides 10) 11	Nonagon	10 sides 11)	Decagon
sides	Hendecagon	12 sides	Dodecagon
12) Exterior Angles	Exterior angles of polygons sum to 360° . An exterior angle of a <u>regular</u> polygon is found by calculating $\frac{360}{n}$ n is the number of sides.	13) Interior Angles	In a regular polygon, Interior Angle + Exterior Angle = 180°
14) Tessellation	A pattern created with identical shapes that fit together with no gaps.		

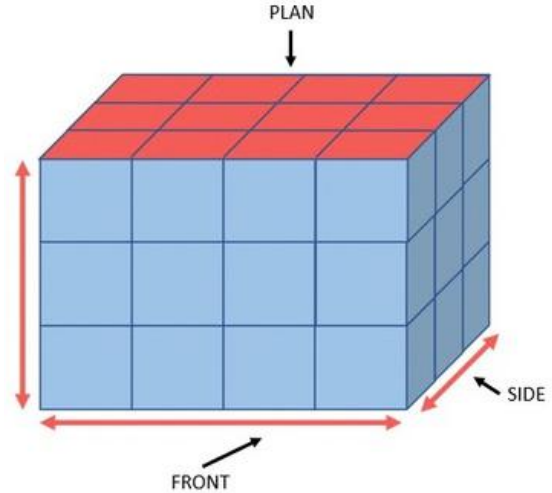
KPI 9.18 Vectors 1

1) Vector	Vectors represent movement of a certain size in a certain direction, they are represented on a diagram with an arrow.		
2) Magnitude	Magnitude is defined as the length of a vector.	3) Scalar	A scalar is the number we multiply a vector by.
4) Column vector	$\begin{pmatrix} a \\ b \end{pmatrix}$ a: movement along the x-axis (left/right) b: movement along the y-axis (up/down)		
5) Adding and subtracting column vectors	$\begin{pmatrix} a \\ b \end{pmatrix} + \begin{pmatrix} c \\ d \end{pmatrix} = \begin{pmatrix} a + c \\ b + d \end{pmatrix}$	6) Multiplying vectors	To multiply a column vector by a number, we multiply both values in the vector by that number.
7) Resultant vectors	The resultant vector is the vector that results from adding two or more vectors together. 		
8) Parallel vectors	Travel in the same or opposite direction. Can be of varying lengths. Must be scalar multiples of one another.	The vectors $\begin{pmatrix} 8 \\ 2 \end{pmatrix}$ and $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ are parallel because $\begin{pmatrix} 8 \\ 2 \end{pmatrix} = 4 \begin{pmatrix} 2 \\ 3 \end{pmatrix}$	

KPI 9.19 Transformations 1

1) Transformations	There are four types of transformations: Reflection Rotation Enlargement Translation	2) Object	This is the original shape used to perform the transformation on
3) Image	This is the new shape created as the result of the transformation.	4) Congruent	Two (or more) shapes that are the same size and the same shape.
5) Reflection	A shape is reflected in a line of symmetry. When a shape is reflected the image is always congruent to the object. The line of symmetry used must be given or found using an equation. An object and its image are always the same perpendicular distance from the line of symmetry. E.g. Reflect shape A in the line $x=1$ 	6) Rotation	When rotating a shape we must have 3 pieces of information. Centre of rotation given as a coordinate (x,y) Angle of rotation (usually 90°, 180°, 270°) Direction (clockwise or anticlockwise) 
7) Enlargement	When enlarging a shape we must have two pieces of information. Centre of enlargement given as a coordinate (x,y) Scale factor 	8) Translation	A translation is a movement of an object. When a shape is translated the image is congruent to the object. Translations are described using column vectors $\begin{pmatrix} a \\ b \end{pmatrix}$ a: movement along the x-axis (left or right) b: movement along the y-axis (up or down) E.g. Translate the original triangle ABC by the vector $\begin{pmatrix} 6 \\ -4 \end{pmatrix}$ 

KPI 9.20 Plans and Elevations

1) Plan	View looking vertically downwards.	
2) Side elevation	View looking horizontally from the side.	
3) Front elevation	View looking horizontally from the front.	

KPI 9.21 Arcs and Sectors

1) Circumference	The perimeter of the circle. $C = \pi d$	5) Area of a circle	$A = \pi r^2$
2) Perimeter of a semi-circle	$P = \frac{\pi d}{2} + d$	6) Area of a semi-circle	$A = \frac{\pi r^2}{2}$
3) Perimeter of a quarter-circle	$P = \frac{\pi d}{4} + 2r$	7) Area of a quarter-circle	$A = \frac{\pi r^2}{4}$
4) Perimeter of a three-quarter circle	$P = \frac{3}{4} \pi d + 2r$	8) Area of a three-quarter circle	$A = \frac{3\pi r^2}{4}$

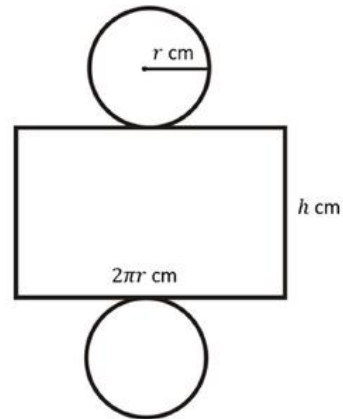
KPI 9.22 Surface Area

1) Surface Area

The total area of the surface of a three-dimensional object. For example, the surface area of a cube is the area of all 6 faces added together. It is measured in square units. E.g. square centimetres (cm²), square metres (m²).

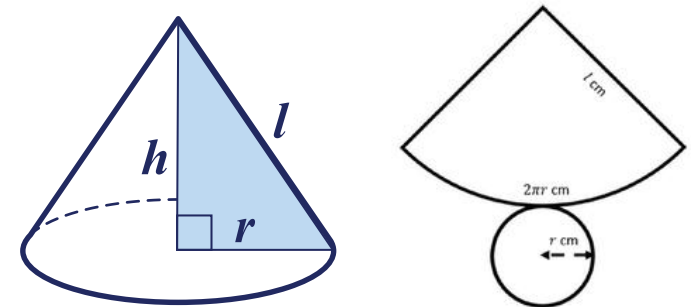
2) Cylinder

$$\text{Surface Area} = 2\pi r^2 + 2\pi rh$$



3) Cone

$$\text{Surface Area} = \pi r^2 + \pi rl$$

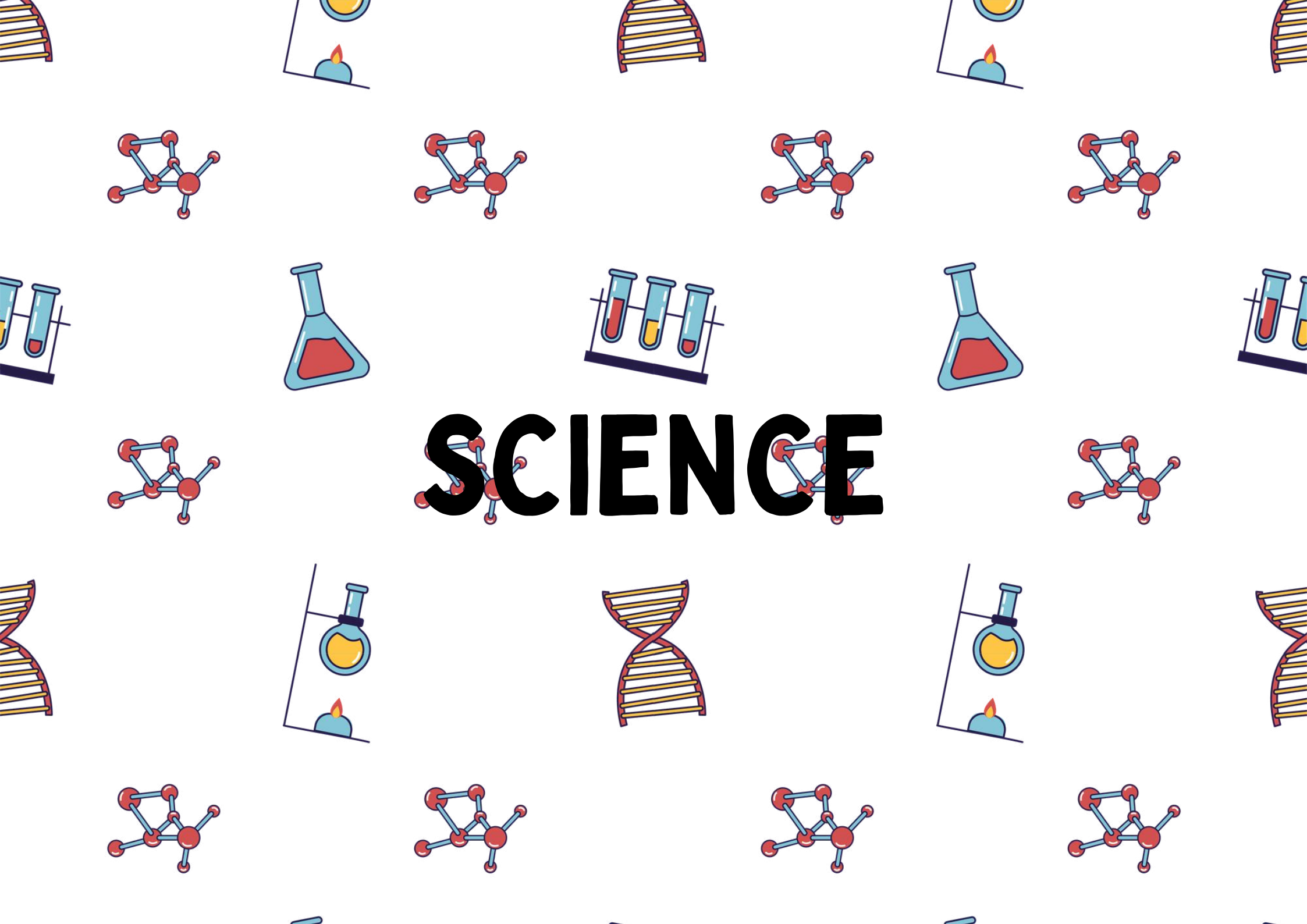


4) Sphere

$$\text{Surface Area} = 4\pi r^2$$

5) Hemi-sphere

$$\text{Surface Area of a Hemi-sphere} = 3\pi r^2$$

The background features a repeating pattern of various scientific icons. These include DNA double helix structures, molecular models with red spheres and blue rods, laboratory glassware like Erlenmeyer flasks and test tubes containing colored liquids, and a Bunsen burner with a flame. The word "SCIENCE" is centered in a large, bold, black font, with a molecular model integrated into the letter "I".

SCIENCE

Year 9 Cycle 1 - Science

KS3 Waves Knowledge Organiser

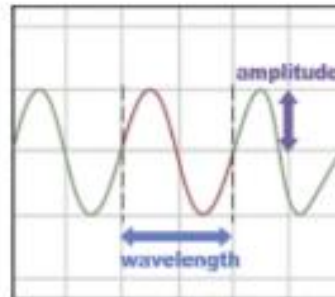
Key Words (Sound)

Doppler effect	The apparent change in a wave's frequency based on its motion relative to the observer
human auditory range	The frequency of sound waves which can be heard by humans. This usually falls between 20 Hz and 20 000 Hz.
medium	A substance or material that carries a wave.
oscillation	Regular movement from the resting position which varies in position and magnitude.
speed of sound	How fast sound waves transfer energy through a medium. In the air, this is approximately 343 m/s.
vacuum	An absence of matter.
Redshift	The colour change of stars moving away due to the doppler effect

Wave Properties

All waves have the following properties:

- wavelength:** the distance from a point on one wave to the equivalent point on the adjacent wave, measured in **metres (m)**;
- amplitude:** the distance between the wave's resting position and a peak or trough, measured in **metres (m)**;
- frequency:** the number of waves passing a point each second, measured in Hertz (Hz).



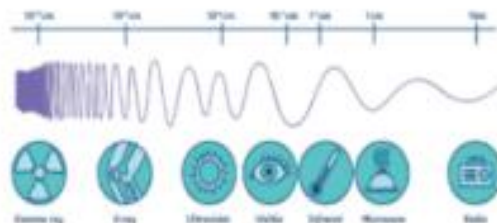
Transverse and Longitudinal Waves

A wave is a means of transferring energy between stores.

There are two main types of waves: **longitudinal** and **transverse**.

Longitudinal Waves	Transverse waves
Longitudinal waves transfer energy parallel to the direction in which the waves oscillate. They are made up of compressions and rarefactions . A sound wave is an example of a longitudinal wave.	Transverse waves transfer energy perpendicular (right angles) to the direction in which the waves oscillate. They are made up of peaks and troughs . A light wave is an example of a transverse wave

Electromagnetic waves transfer energy from a source to an absorber as transverse waves. The different waves are grouped depending on their frequency and form a continuous spectrum known as the electromagnetic spectrum. Each of the frequencies of waves travel at the same velocity and can pass through a vacuum as well as air



Year 9 Cycle 1 - Science

KS3 Waves Knowledge Organiser

The Doppler effect

Our body interprets waves based on their **frequency** and **wavelength**. The most common example being sound.

A sound with a higher frequency is understood as a higher pitched sound. A lower frequency sound wave is a lower pitch.

If an object making a sound wave moves towards you. Even though it releases sounds at a constant frequency, the waves seem to be closer together because the object moves forwards as it emits the sound. So sound reaches you at a higher frequency and higher pitch.

If the object moves away from you, the waves seem further apart so are at a lower frequency and pitch.



Reflection

Aim: Investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.

In this investigation, you are finding out which type of surface emits the most infrared radiation:

- dark and matt
- dark and shiny
- light and matt
- light and shiny Method:

Method:

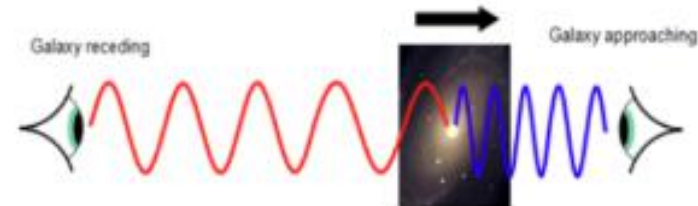
1. Cover a beaker with one layer of dark, matt material and a lid
2. Boil a kettle of water and fill the beaker
3. Measure the starting temperature of the beaker with an infrared thermometer from a distance of 30cm (measured with a ruler)
4. Record the temperature of the beaker every minute
5. Stop after 10 minutes
6. Repeat for different materials

Red shift

The **doppler effect** also applies to light. Galaxies moving fast enough away to towards us leads to a change in the light's frequency.

As a star moves away from us, the waves appear further apart so the frequency decreases and the wavelength increases. Looking at the electromagnetic spectrum, this means the light moves towards the red side of the spectrum, we call this **red-shift**.

In rare occasions some stars are moving away from us so the frequency increases and the wavelength decreases. This results in the **colour** appears more blue which is called **blue-shift**.

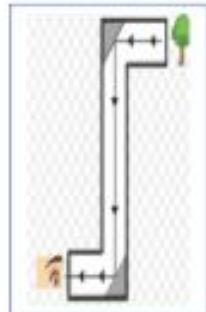


Frequency	Waves	Use	Other information
Low	Radio wave	Communication via television and radios	Easily transmitted through air and can be reflected to change their direction. Harmless if absorbed by the human body. Are reflected back off the atmosphere and cannot pass through into space.
↑	Microwave	Communication using satellites and for cooking food	When the molecules absorb microwaves, their internal energy increases. This can be harmful when internal body cells become heated by over exposure to microwaves. Can pass through the atmosphere and into space.
	Infrared	Short range communications (remote controls), Electrical heaters, cooking food, optical fibres, thermal imaging cameras	It can cause burns to skin
	Visible light	Lighting, photography, and fibre optics	Frequency range that is detectable by the human eye.
	Ultraviolet	Sterilising water and killing bacteria. Detecting forged bank notes	Causes skin tanning and can lead to burns or skin cancer.
	X-rays	Medical imaging and airport security scanners	Very little energy is absorbed by body tissues.
High	Gamma rays	Sterilising medical equipment or food and treatment for some cancers	Instead, it is transmitted through the body. These waves can lead to gene mutation and cancer

Year 9 Cycle 1 - Science

How we see - Key words and definitions

Reflection	Light ray bouncing off a surface.
Refraction	A ray is bent as it passes from one medium to another.
Absorbed	When light is taken into a material and not transmitted or reflected.
Opaque	Light rays cannot pass through.
Transparent	Light rays can pass through.
Transmitted	When light rays pass through a material.
Incident ray	The light ray hitting a surface.
Shadow	A dark area caused by an opaque object blocking light rays.
Angle of reflection	The angle between the normal and the reflected ray.
Translucent	Some light rays can pass through.
Dispersion	The splitting of colour into a spectrum
Focal point	The point where parallel rays of light are brought together by the lens
Normal	A line drawn at right angles to the reflecting surface
Diffuse reflection	Light rays are scattered by rough surfaces



Step 1. Use a ruler to draw the normal line 90° to the surface.



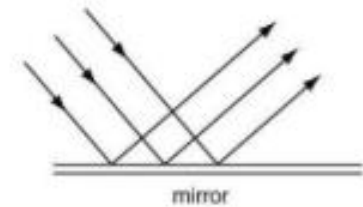
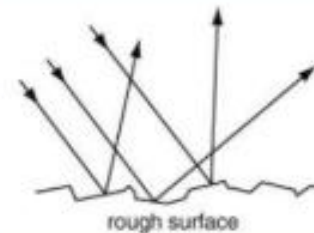
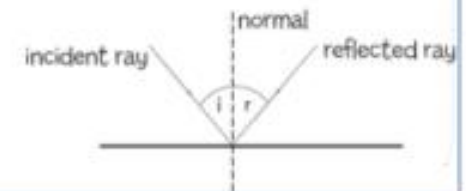
Periscopes contain two mirrors and use reflection to view objects above the water in submarines or above eye level on land.

Light travels in straight lines. We picture these as rays.

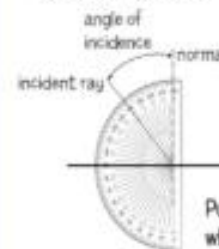


Light bounces off a flat surface in a regular way.

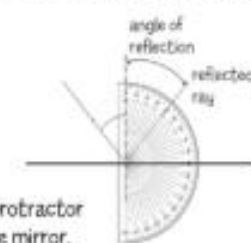
angle of incidence (i) = angle of reflection (r)



Step 2. Measure the angle of incidence. Draw the incident ray at this angle.



Step 3. Measure the same angle on the other side of the normal. Draw the reflected ray at this angle.

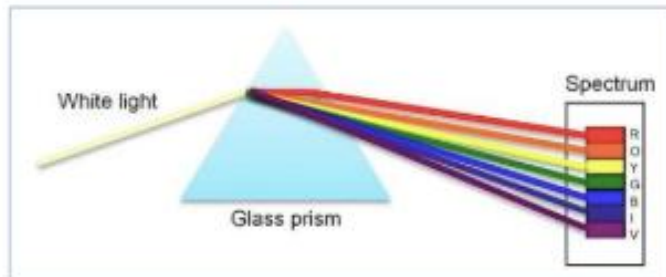
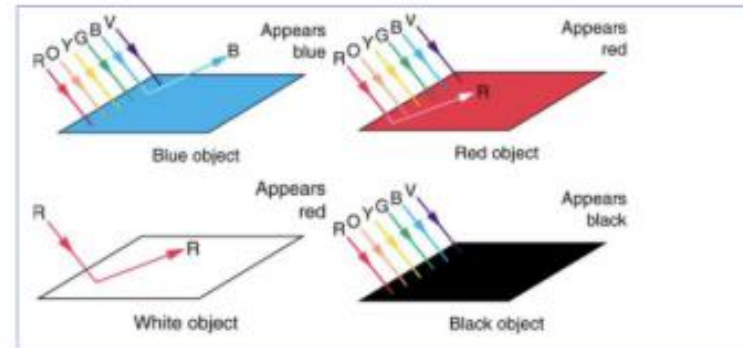


Put the centre of a protractor where the ray hits the mirror.

Year 9 Cycle 1 - Science

How the speed of light changes. In different materials, light travels at different speeds.

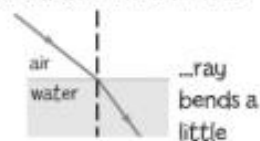
speed of light	material	refractive index (R.I.)
Light slows down when moving into these materials.	vacuum or air	R.I. is a measure of how much light slows down.
↓	water	↓
slower	glass	bigger
	diamond	



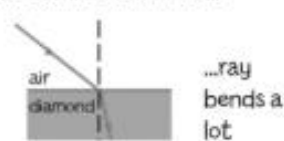
How refractive index determines the amount of refraction.

What matters is the difference between the two materials.

small difference in R.I. ...

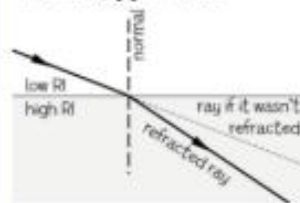


big difference in R.I. ...



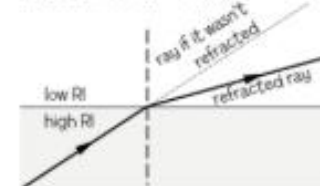
How light refracts at a boundary. The change in speed makes light rays bend (refract).

If a ray passes into a material with a bigger R.I. ...



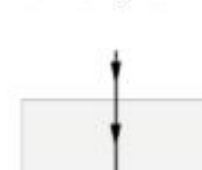
... it bends towards the normal

If a ray passes into a material with a smaller R.I. ...



... it bends away from the normal

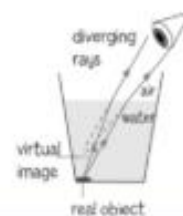
If a ray hits the boundary at 90° ...



... it does not bend at all.

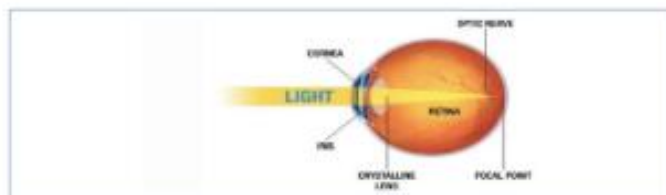
How the brain interprets diverging rays.

We trace two rays from the object which diverge when they pass from water to air.



The brain projects back the rays (dotted lines) to a point where they appear to have come from.

This point above the object. The image is virtual because the rays only appear to meet.





CREATIVE

ART | DRAMA | MUSIC

Cycle 1 in Art will focus on:
Art & Design skills

This cycle we will be developing an understanding of **the key skills in art and design.**

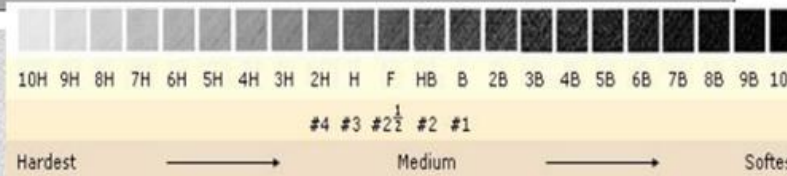
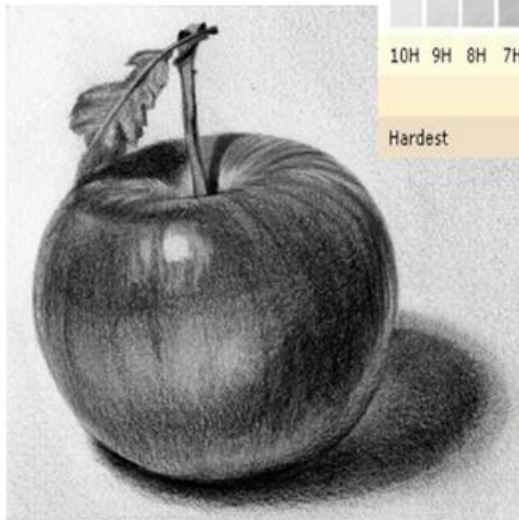
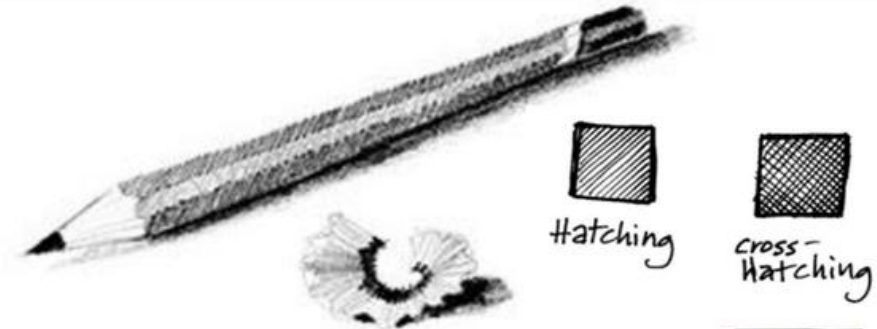
We are doing this because we want you to become more **creative and confident artists.**

HOW TO USE A PENCIL

Tone refers to the lightness or darkness of something.

This could be a shade or how dark or light a colour appears.

Tones are created by the way light falls on a 3D object. The parts of the object on which the light is strongest are called highlights and the darker areas are called shadows.



Pencils come in a range of hardness:

- The **H** range is hard and light and useful for design or technical drawings
- The **B** range is soft and dark and more suitable for shading and tonal drawings.

How many different types of marks can you see in this Vincent Van Gogh drawing?

Mark making is a term used to describe the different lines, patterns, and textures we create in an artwork.

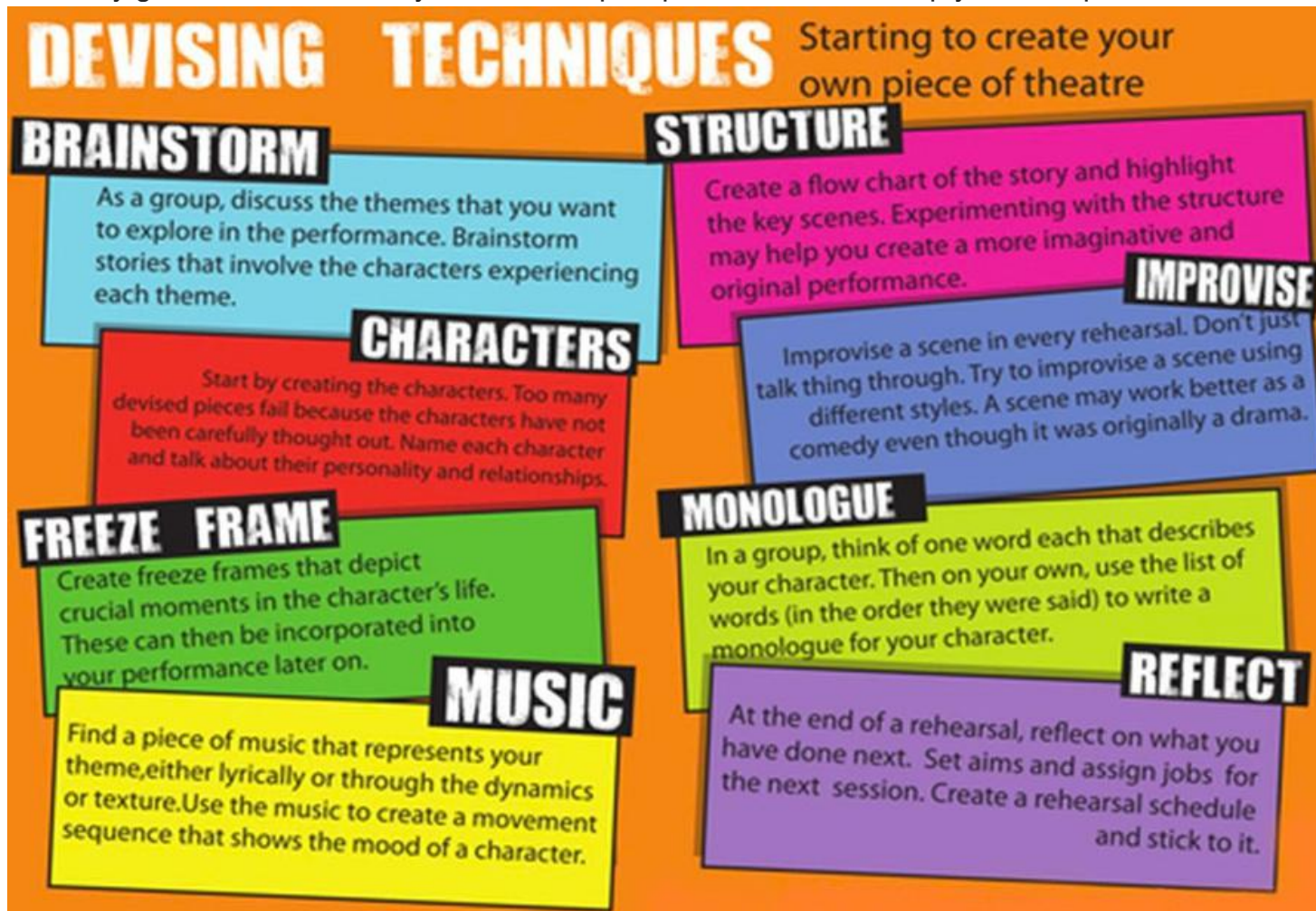


USEFUL WEBSITE for DRAWING :
<https://www.bbc.com/bitesize/guides/zc7sfrd/revision/2>

Term 1 in Drama will focus on developing and devising drama based on different stimuli.

What is devising?

Devising is a process in which the whole creative team develops a show collaboratively. You are usually given a stimulus that you use to help inspire ideas to make up your own piece of drama.



What is a stimulus?

A stimulus is a starting point to generate ideas. It may be a picture, song, poem, short story, object, or even just a word! It is meant to be explored, discussed and used to create an original piece of drama. The final piece of drama does NOT need to resemble any starting stimulus – the stimulus is simply the starting point in order to generate ideas to explore.

The purpose of a scene.

You need to have a firm decision before the start of the devising process on what is the purpose of your scene. This will then influence how structure your play and any drama techniques you might

What about your audience?

Always consider your audience when you are devising the work. What do you want your audience to think, feel, see etc. This could be as simple as audience sightlines.

Dramatic techniques

Experiment with different techniques – don't always use the same ones or not be willing to change your mind if it is not working for your scene

KEYWORD LOG –Devising

Drama Skill	Definition
Audience	The viewers of the performance. Will often find themselves involved in the production.
Cross Cutting	Two scenes that happen on stage at the same time.
Devising	To create an original performance without the use of scripts.
Flashback	Drama technique of showing events from the past.
Narration	one or more performers speak directly to the audience to tell a story, give information or comment on the action of the scene or the motivations of characters
Performance Stimulus	An act of presenting a play, concert or other form of entertainment.
Story telling	The idea on which the 'Devised' work is based.
Structure	Delivering a narrative that informs the audience.
Style	How the plot or story of a play is laid out, How the work is presented on stage.
Tableaux	Frozen Pictures.
Thought tracking	A character speaks out loud either their own or another characters thoughts and feelings.

Tips for creating work:

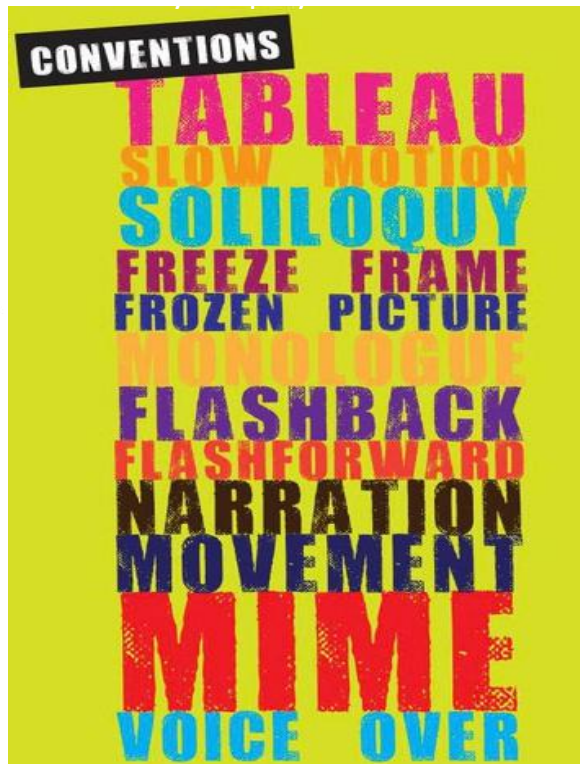
- ✓ Be co-operative! (Take part and follow the instructions of your team members)
- ✓ Listen respectfully to others' ideas
- ✓ Share your own ideas and make contributions
- ✓ Stay in your working space-Don't distract others
- ✓ Think about where your audience will be and rehearse with this in mind
- ✓ Don't be afraid to experiment with ideas, conventions, techniques. If it doesn't work start again.

Top tip for devising:

Once you have a theme, story or idea in mind, keep questioning every new thing that comes into the piece of theatre you are devising. Question its relevance to the central idea of what you want to communicate. It is important to justify every decision you make in the devising process through making it link to your core objective for the piece you are creating.

How to make a play interesting :

Modern plays incorporate a range of Dramatic Conventions to help make the performance interesting for an audience. However, the conventions used in a play will depend on their style and genre of the performance. Dramatic conventions can influence how your structure your play.



Year 9 Cycle 1 - Music

Film Music – Cycle 1

Music in a film is there to set the scene, enhance the mood, tell the audience things that the visuals cannot, or manipulate their feelings. Sound effects are not music!

Some music is **composed specially** for a film. Much of this is broadly classical in style.

Some music used in film soundtracks was composed for other (non-film) purposes, but is **adopted** for use in a film because it fits the film-maker's intentions.

Sometimes a song, usually a pop song, is used as a **theme song** for a film. This helps with marketing and **publicity**.

Instruments & Common Associations (Musical Clichés)	
Woodwind	Natural sounds such as bird song, animals, rivers
Bassoons	Sometimes used for comic effect (e.g. a drunkard)
Brass	Soldiers, war, royalty, ceremonial occasions
Tuba	Large and slow-moving things
Harp	Tenderness, love
Glockenspiel	Magic, music boxes, fairy tales
Timpani / Drums	War, fighting, thunder
Strings	Often used to portray emotions: passion, grief, etc.
Tremolo Strings	Tension, fear, drama

KEY TERMS

Metronome	A click track that helps the composer follow the PULSE
Cues	The parts of the film that require music . This is agreed between the director and the composer.
Diagetic	Music that is part of the action: The characters can hear it!
Non-diagetic	Music that is NOT part of the action: The characters CANNOT hear it.
Leitmotif	A short melody that is associated with a character or idea in a film.
Mickey Mousing	When the music fits precisely with a specific part of the action in a film.
Sync Point	A precise moment where the timing of the music needs to fit with the action.
Underscore	Where music is played at the same time as the action or dialogue.



John Williams composed the music for Star Wars, Jaws and Indiana Jones

KEY COMPOSERS

John Williams, Hans Zimmer, Danny Elfman, Rachel Portman, Anne Dudley



HUMANITIES

HISTORY | GEOGRAPHY | RE

Year 9 Cycle 1 - History

Key events:

1933: Hitler comes to power in Germany.

1935: Nuremburg Laws are put in place in Germany, removing citizenship from Jews and preventing marriage between Jews and Germans.

1938: Kristallnacht- attack on Jewish businesses and synagogues. Jews arrested. Kristallnacht means night of broken glass.

1939: World War Two begins. Poland is invaded. This increases the number of Jews living under Nazi controlled territories. The yellow star is introduced for all Jews to wear.

1940 onwards: Jews sent to concentration camps and to ghettos.

1941: Senior Nazis come up with the Final Solution- the decision to exterminate the Jews using death camps and gas chambers.

1942 onwards: murder of Jews takes place in death camps and concentration camps.

1945: Hitler commits suicide and World War Two comes to an end. The concentration camps are liberated. War crime trials begin against the perpetrators.

1946-7: The Nuremberg Trials investigate and sentence Nazi war criminals.

1946: Kielce program. 42 Jewish Holocaust survivors are murdered.

1947: The Diary of a Young Girl, by Anne Frank is first published.

In this unit you will learn about how and why the Holocaust happened, as well as exploring what the Holocaust actually was and who it affected. You will also learn about the impacts that it had after WW2 ended.

Key facts:

- Approximately **6 million Jews were murdered** in the Holocaust.
- **Many other groups were persecuted** and murdered by the Nazis: Roma/Sinti, homosexuals, political opponents, the mentally and physically disabled amongst others.
- Victims were not only gassed. They were also victims of mass shooting, death through forced labour, poor living conditions, medical experiments etc.
- **Anti- Semitism was not new** to the Nazi period. It has existed since at least Roman times.



Key words:

Anti-Semitism- hatred of the Jews

Bystander- a person who is present during an event but does not take part.

Concentration camp- a place in which large groups of people are imprisoned, sometimes to provide forced labour or await mass execution.

Death camp- camps that were designed to specifically exterminate groups in Nazi occupied countries. E.g. Auschwitz.

Final Solution- the Nazi policy of how the Jews would be executed, decided in 1941.

Genocide – the deliberate killing of a group of people, especially of a specific nation or an ethnic group.

Ghetto- restricted part of a city where Jews were forced to live. Living conditions were very poor.

Holocaust- The word comes from the Jewish word for a burnt offering. It refers to the extermination of the Jews and other minority groups completed by the Nazis during WW2.

Human rights- rights which all people are entitled to e.g. right to life, freedom of belief etc.

Liberation- being set free.

Perpetrator- a person who carries out an illegal or immoral act.

Persecution- treating someone wrongly based on gender, race, religion, age, political views etc.

Minority Group – A group of people (ethnicity, religion, ability etc.) who make up the minority of the population where they live.

Holocaust denial – The growing issue of mistruth around the Holocaust.

Resources

Vocabulary	Definitions
Carbon footprint	A measurement of all the greenhouse gases we individually produce
Energy mix	The range of energy sources of a region or country
Renewable	A resource that will never run out.
Non renewable	A resource that will run out.
Fracking	Injecting liquid at high pressure into cracks in rocks to extract natural gas
Fossil Fuels	A natural fuel such as coal or gas, formed in the geological past from the remains of living organisms.
Resource	Anything that is used to satisfy human needs.
Global warming	A gradual increase in the overall temperature of the earth's atmosphere.
Consumption	The action of using up a resource.
Scarcity	The state of being scarce or in short supply; shortage.
Pollution	The presence in or introduction into the environment of a substance which has harmful or poisonous effects.
Distribution	The action of sharing something out among a number of recipients
Sustainable	Preserving something for future uses.

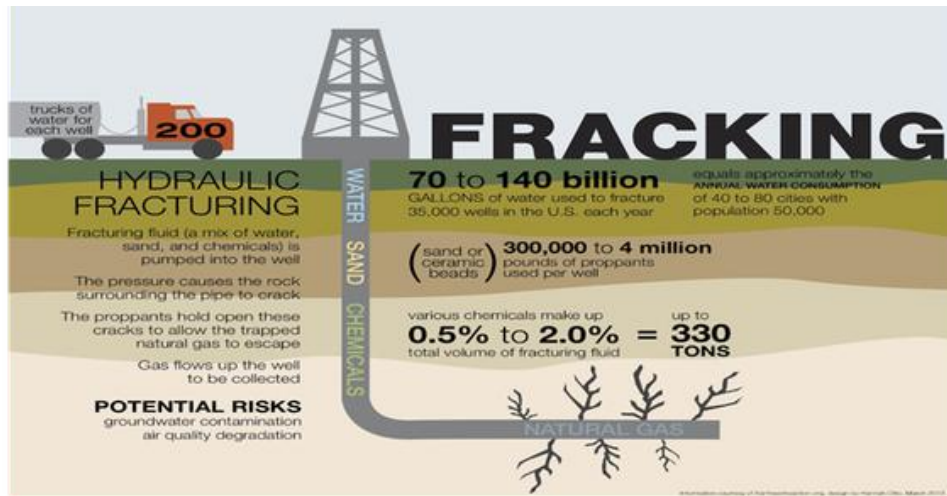
Water	- Used for survival, washing, food production, industry - We need clean safe water otherwise we can get stuck in a cycle of poverty
Energy	- Traditionally we get energy from oil, coal and wood - Many different sources - Used for production, heating, transport and for water supply (e.g. wells)

Water	- Fresh water is unequally distributed - Water footprint is the amount of water used per day - Global average is 1240 l per day - Bangladesh is 896 l per day - USA is 2483 l per day 1 in 5 (more than 1.2 billion people) live in areas of water scarcity 1 in 3 (2.4 billion people) have no access to clean drinking water
Energy	- Richest billion people use 50% of the energy - Poorest billion people use 4% of the energy - Countries import and export energy - Some countries do not have their own sources of energy

Table 1: Energy Sources

Renewable <i>Energy derived either directly or indirectly from the sun</i>	Nonrenewable <i>Energy derived from fossil fuels</i>
Solar	Coal
Biomass	Oil (petroleum)
Wind	Natural gas
Biofuels	Tar sands
<i>Energy derived from gravity</i>	<i>Energy derived from the fission of atoms</i>
Tidal	Nuclear (uranium)
Hydropower	
<i>Energy from the interior of the earth</i>	
Geothermal	

Resources



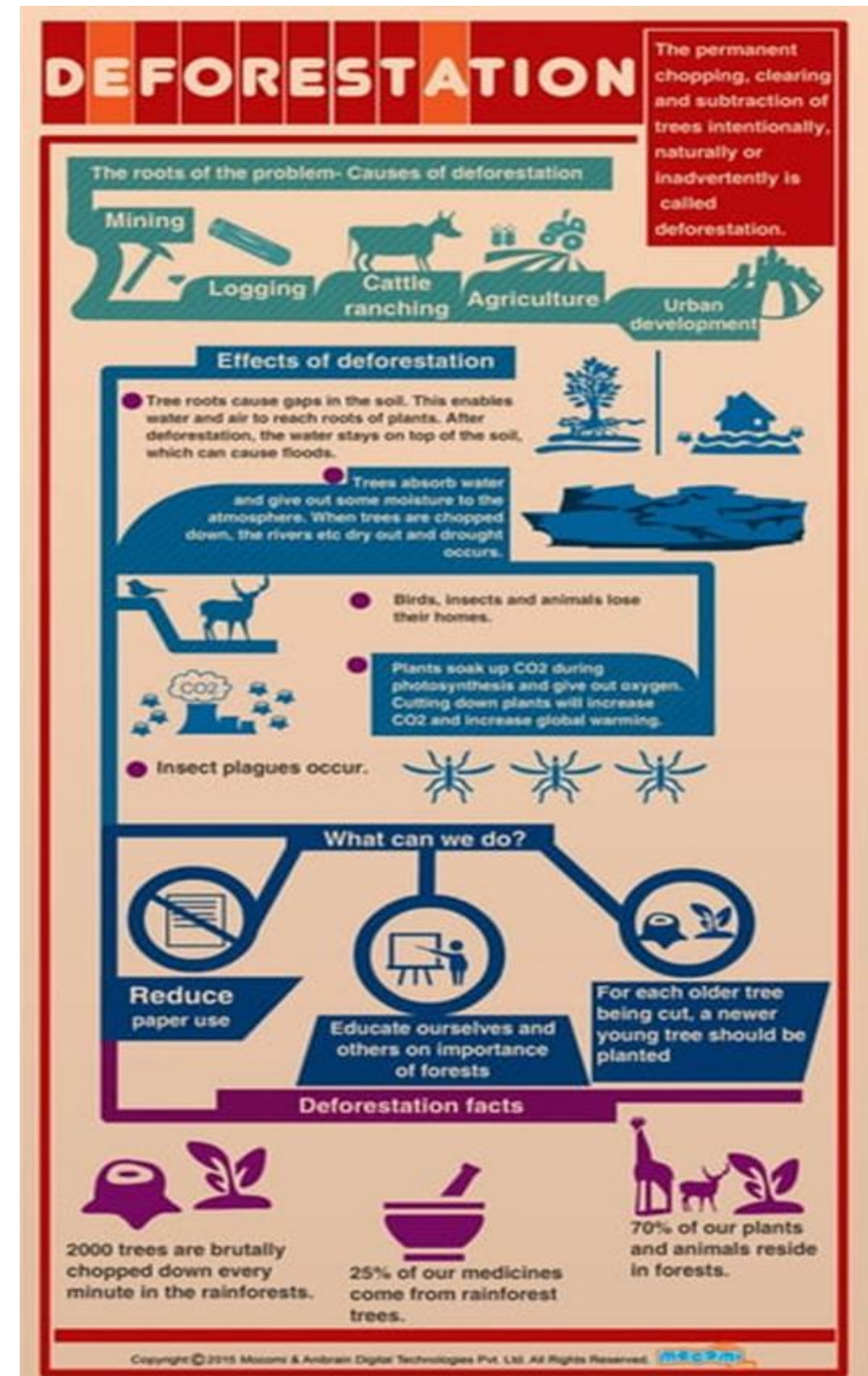
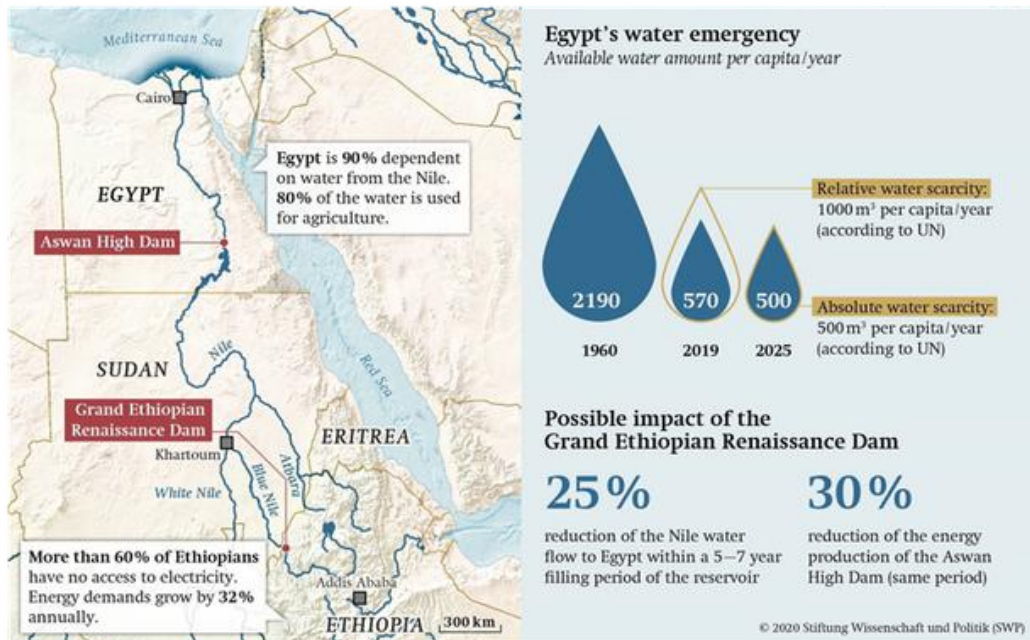
Fracking

Positives:

- ✓ Less harmful than coal
- ✓ Less dependant on fossil fuels
- ✓ Provides thousands of jobs

Negatives:

- Can cause earthquakes
- Habitat destruction
- Uses huge quantities of water



Year 9 Religious Education Learning Cycle 1 - Suffering

Buddhism and Suffering

Most Buddhists believe that the negative actions and beliefs of human beings such as greed, anger and ignorance give rise to evil. These three things stop Buddhists from reaching **enlightenment**.

Buddhists do not believe that human beings are evil, but they generally accept that humans create suffering through their greed, anger and ignorance.

The Four Noble Truths



1. **Dukkha**
The truth of suffering.
2. **Samudaya**
The truth of the origin of suffering.
3. **Nirodha**
The truth of the end of suffering.
4. **Magga**
The truth of the path to the end of suffering.

Christianity and Suffering

Evil and suffering could make Christians question God's omnipotence, omnibenevolence, or his omniscience. For example:

- If God was all-powerful, wouldn't he stop natural disasters?
- If God was all-loving, wouldn't he stop suffering?
- If God was all-knowing, wouldn't he know that people were going to do something evil and stop them?

Christians argue:

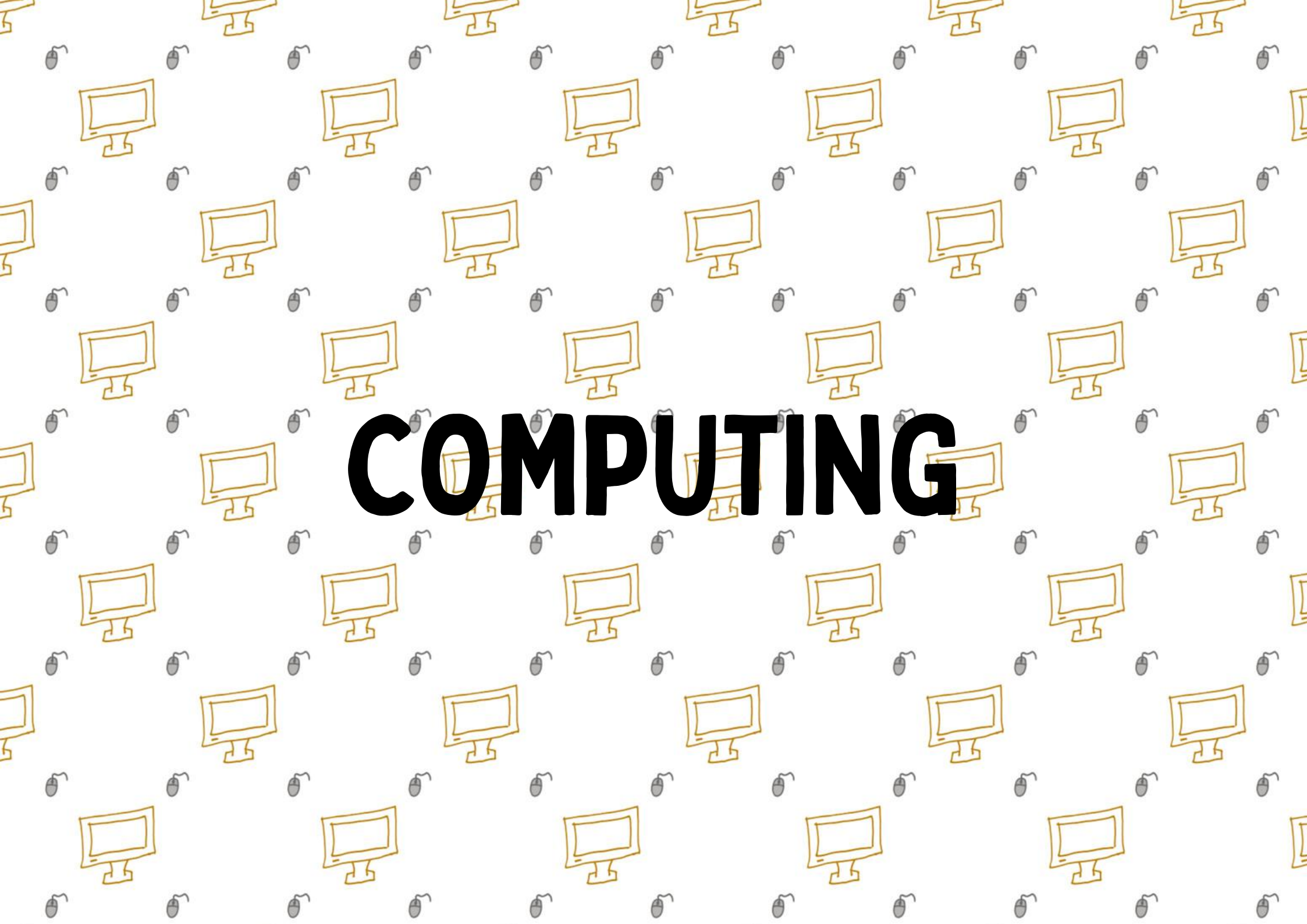
- Free Will causes evil and suffering
- Suffering is necessary
- Teaches us to be better
- God has a plan beyond our understanding

MORAL EVIL	NATURAL EVIL
Moral evil refers to the willful evil acts of human beings such as murder and theft.	Natural evil refers to natural disasters, diseases, or genetic defects that result in pain and suffering.
Murder, rape, theft, dishonesty, an act of injustice, and war are some examples.	Earthquakes, floods, tsunamis, hurricanes, tornadoes, droughts, famines, diseases and birth defects are some examples.
Has human perpetrators	No human perpetrators

Humanism

Humanists reject the idea or belief in a supernatural being such as God. This means that humanists class themselves as agnostic or atheist.

Humanists such as Stephen Fry and David Attenborough do not believe in God, or that suffering is part of God's plan.



COMPUTING

In cycle 1 we study Python programming with a focus on learning the basics of this powerful computer language to solve problems.

Key words and definitions

Python	Python is a popular programming language used in schools and industry. Python is used by Google, NASA, Instagram, Facebook and thousands of other companies to develop applications.
Syntax	A set of rules that a programming language must follow to work.
Debugging	Finding and fixing errors (called bugs) in your program code including syntax errors.
Input	Any information or data sent to a computer for processing.
Output	Any information or data sent to another device or user, for example to a monitor, printer or speaker.
Variable	A named value to store data that changes.
Constant	A named value which cannot be changed.
Integer	A positive or negative whole number for example 7 or -3.
Float (or Real)	A positive or negative number with a decimal part for example 3.66.
Print command	This outputs a message to the screen based on your input.
Comments	Code that does not actually run, but is there to explain what the code does. In Python # is used as the comments symbol.
Multiply	*Is the symbol for multiply (not 'x')
Rounding	To round a number to the nearest whole number.

Topic 1

To learn key Python commands

Learning outcome 1: To understand key Python commands

Input	If the program asks for username and password this would be called an input to the program
Output	If someone puts in the wrong password a program will output a message saying wrong password

```
password=''
animal=input( ''' Please choose an animal for your password
1. Lion
2. Zebra
3. Chetah
4. Camaleon
5. Dragon ''')
if animal==1: password='Lion'
elif animal==2: password='Zebra'
elif animal==3: password='Chetah'
elif animal==4: password='Camaleon'
else :password= 'dragon'
```

Fig 1: IF statement example code

You will understand the key Python commands and the correct syntax for these commands

Learning outcome 2: To be able to write and test programs to solve a range of problems.

Key words and definitions

Software	Programs or applications that can be used on a computer system.
Data Type	Tells you what kind of data it is eg integer, real, string.
String	A data type used for text.
Testing	A way of checking if a program works correctly.
Test data	Inputs chosen to see if a program works correctly.
Test plan	A detailed plan of how you are going to test a program including the test data to be used.
Sequence	Where each instruction is carried out in order one after another.
Selection	Where decisions are made that affect which instructions are carried out next.
Iteration	Where a certain set of instructions are repeated.
Validation	Checks that an input is correct and suitable.
Operators	Mathematic functions like add, subtract and multiply.
Algorithm	A step-by-step set of rules or instructions.
Flowchart	A graphical way of showing an algorithm.
Pseudocode	A set of instructions in the style of a programming language but using plain English.
Comments	Used to explain what code is doing and start with # in Python.
File	Where you save your programs to so that you can use them again in the future.
Database	A store of data (information) held in a computer.



Computing

Fig. 2: Algorithm: Flow diagram example.

Testing

Your programs should be tested to make sure they work as expected and to identify any errors. The errors should then be fixed and your program retested to see it now works as expected.

Correcting common errors in Python

1. Check your brackets ()
2. Check your quotation marks ' " " '
3. Check your capitalisation
4. Check your spelling
5. Check your indents



DESIGN & TECHNOLOGY

DT | FOOD & NUTRITION

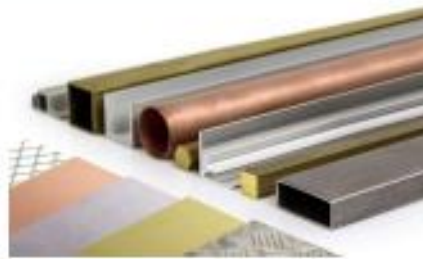
Steel Garden Trowel Knowledge Organiser

Materials, properties and essential facts

1/2



PROJECT EXAMPLE



MATERIAL RECOGNITION

Project focus

A garden trowel manufactured from sheet mild steel using cutting, drilling, folding, forming, cold riveting and protective dip coating.

Material families and project material

Ferrous metal: contains iron. Mild steel is ferrous, strong, tough and malleable, but it can rust.

Non-ferrous metal: does not contain iron. Aluminium and copper do not rust like steel.

Alloy: mixture containing a metal and other elements. Mild steel is an alloy of iron with a small amount of carbon.

Corrosion protection: a barrier coating prevents oxygen and moisture reaching the steel. Dip coating adds a plastic layer and improves grip.

Properties that explain material choice

Malleability: ability to be formed by bending or pressing.

Toughness: ability to absorb impact without fracturing.

Hardness: resistance to wear and indentation.

Stiffness: resistance to bending.

Corrosion resistance: ability to resist environmental attack.

Essential facts

1. Sheet, bar, rod, tube and angle are common metal stock forms.
2. A burr is a dangerous raised edge left after cutting or drilling and must be removed.
3. Folding and forming reshape metal without removing material.

Steel Garden Trowel Knowledge Organiser

Tools, processes, vocabulary, safety and quality

2/2



Guillotine – straight cuts



Box folder – controlled straight folds



Brazing hearth – heats metal for dip coating



Pillar drill – rivet holes



Cold riveting – dome underneath on a dolly

ALSO RECOGNISE: hacksaw • scriber • centre punch • dividers • engineers blue

Manufacturing processes

Cutting: sheet steel is cut to shape using a guillotine or hand shears. Curves and detailed shapes can be cut with a hacksaw.

Marking out: use engineers blue, a steel rule, scriber, dividers and a centre punch for accurate lines and hole positions.

Shaping and bending: form the blade and neck by hand, using the box folder to create straight bends.

Drilling: drill holes for the handle using a pillar drill.

Cold riveting: the handle is attached using aluminium rivets. Place the rivet through the handle and blade with the domed head underneath, supported on a dolly. Use a hammer and rivet set to form the head on top.

Dip coating: the steel blade is heated in the brazing hearth and then dipped into plastic coating powder to give a smooth, durable finish.

Finishing: remove sharp edges with a file and use wet and dry paper for a smooth finish.

Keywords and definitions

Ferrous metal: a metal that contains iron, e.g. mild steel.

Mild steel: a common, low carbon steel that is easy to cut, shape and drill.

Rivet: a permanent fastener used to join two pieces of metal.

Dolly: a solid metal block with a curved surface used to support a rivet head from underneath.

Engineers blue: a marking fluid used to make layout lines visible on metal.

Box folder: a sheet metal machine used to make straight, accurate bends.

Brazing hearth: a hot-work area used to heat metal before dip coating.

Dip coating: a process where a heated metal part is dipped into plastic powder, which melts and fuses to the surface.

Checks before you finish

Accuracy: check all bends match the template and holes are in the correct positions.

Safety: wear goggles and heat resistant gloves. Use the brazing hearth safely and follow instructions.

Quality: check for smooth edges, neat rivet heads and an even, well-bonded plastic coating with no thin spots.

Safety signs to know



Wear goggles
(mandatory)



Danger
(warning)



Fire exit
(emergency)



Do not run
(prohibition)

Key equipment and processes



Guillotine
(straight cuts)



Box folder
(straight folds)



Brazing hearth
(heats metal for dip coating)



Cold riveting
(dome underneath on dolly)



Pillar drill
(rivet holes)



Hacksaw
(cut curves and detail)



Scriber
(marking out)



Centre punch
(accurate hole positions)



Dividers
(set and transfer sizes)



Engineer's Blue
(marking fluid)

General workshop safety

- Keep bags and coats away from walkways to prevent trip hazards.
- Wear the correct PPE (goggles and heat resistant gloves where required).
- Keep benches and floors tidy and free from scrap.
- Report any damage, faults or accidents to the teacher immediately.
- Know where the emergency stop buttons are and how to use them.

Machine and tool safety

- Use the guillotine or hand shears only with supervision.
- Keep fingers clear of the cutting line and moving parts.
- Secure the workplace in a vice or clamp before drilling on a pillar drill.
- Keep hands behind hacksaw blades and use a long, controlled stroke.
- Use a scriber and centre punch carefully, pointing away from your hand.
- Use engineer's blue sensibly, keep it off skin and clothing and avoid getting it in your eyes.

Brazing hearth and dip coating safety

- The brazing hearth is used to heat the metal before dip coating.
- Treat metal near the hearth as hot, even after heating.
- Use ventilation and extraction to remove fumes.
- Use heat-resistant tools or tongs as directed.
- Follow your teacher's instructions at all times.
- Allow parts to cool safely before handling.
- Avoid breathing fumes and keep your face away from the heating area.

Cold riveting and finishing safety

- Support the domed rivet head underneath on a dolly.
- Use the hammer and rivet set carefully and keep fingers clear of the striking area.
- Remove sharp edges and burrs with a file.
- Use finishes and coatings with good ventilation.
- Follow COSHH guidance for all chemicals and materials.
- Keep lids closed on powders and liquids when not in use.

Before you finish

Accuracy: check your work matches the template and holes are in the correct positions.

Safety: make sure the work area is tidy, all tools are returned safely and hazards are cleared.

Quality: check for a smooth finish, neat rivet heads and a durable coating with no thin spots.

Construction Skills Board Knowledge Organiser

1/2

Materials, properties and essential facts:



PROJECT EXAMPLE



MATERIAL RECOGNITION

Project focus

A board combining emulsion painting, cutting in, painted dado rail, tiled lower section, pattern-matched wallpaper and scale-plan knowledge.

Material families and project material

MDF: manufactured board made from fine wood fibres and resin. It is smooth and even but vulnerable to moisture at unsealed edges.

Plywood: layers of veneer bonded with alternating grain directions. It is strong and dimensionally stable.

Paint system: emulsion gives colour to the board. Undercoat prepares timber and helps gloss bond. Gloss provides a durable finish.

Tile system: adhesive bonds the tile. Grout fills joints but does not replace adhesive.

Properties that explain material choice

Adhesion: ability of one material to bond to another.

Absorbency: ability to take in liquid.

Durability: ability to withstand use over time.

Water resistance: ability to resist water penetration.

Opacity: ability of a coating to hide the surface below.

Essential facts

1. Preparation controls finish quality: surfaces must be clean, dry, smooth and free from dust.
2. **At scale 1:** 50, 1 mm on the drawing represents 50 mm in real life. At 1:100, 1 mm represents 100 mm.
3. Plans show a space from above. Standard symbols communicate doors, windows and electrical fittings.

Construction Skills Board Knowledge Organiser

Tools, processes, vocabulary, safety and quality

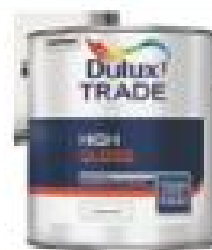
2/2



Emulsion - board finish



Undercoat - prepares timber



Gloss paint - durable top coat



Grout - fills tile joints

ALSO RECOGNISE: Paint brush • roller • filling knife • tile cutter • notched trowel • grout float • spirit level • wallpaper brush • seam roller

Generic manufacturing processes

Surface preparation: fill defects, sand lightly, remove dust and seal absorbent surfaces if required.

Painting: stir well, load the tool evenly, apply thin coats and maintain a wet edge.

Tiling: plan the layout, spread adhesive, place tiles level and grout after the adhesive sets.

Wallpapering: measure with an allowance, cut accurately, apply paste as directed, align the pattern and smooth from the centre.

Plan reading: use scale, dimensions and recognised symbols to interpret the room.

Keywords and definitions

Cutting in: painting a controlled clean edge with a brush

Undercoat: preparatory coat below the finishing coat

Pattern match: alignment of repeated wallpaper design

Grout: material that fills and seals joints

Scale: ratio between drawing size and real size

PPE: personal protective equipment

Checks before you finish

Accuracy: Use a level and tile spacers. Check cut sizes, paint edges, pattern alignment and scale conversions.

Safety: Wear eye protection for sanding and tile cutting. Follow COSHH guidance and keep walkways clear.

Quality: Even paint, crisp edges, level tiles, full grout and correctly matched wallpaper.

Safety signs to know



Wear goggles
(mandatory)



Danger
(warning)



Fire exit
(escape route)



Do not run
(prohibition)

General workshop safety

- **Bags away** to prevent trip hazards.
- **Keep walkways clear** at all times.
- **Wear appropriate PPE** (goggles, gloves, dust mask, ear defenders when needed).
- **Follow instructions** from your teacher and workshop rules.
- **Keep the area tidy** and put tools away after use.
- **Report accidents or spillages** immediately to a teacher.



Safe use of tools and preparation

- **Secure work** before sanding or cutting using a clamp or vice.
- **Use tile cutters and filling knives** safely and as instructed.
- **Keep sharp tools pointed down** when walking and store safely.
- **Clean dust from surfaces** to keep the area safe and improve finish quality.
- **Know the location of emergency stop buttons** if using machinery.



Painting and finishing safety

- **Work in a well ventilated area.**
- **Stir and use coatings carefully** to avoid splashes.
- **Keep lids on paints and gloss** when not in use.
- **Avoid skin contact** and do not breathe in fumes.
- **Wash hands** after use.
- **Use undercoat and gloss** safely, following manufacturer instructions.
- **Follow COSHH guidance** and check product labels for hazards.



Tiling and wallpapering safety

- **Adhesive and grout can irritate skin** – wear gloves and avoid direct contact.
- **Wipe up spills** immediately to prevent slips.
- **Use a spirit level** safely and check it is not damaged.
- **Cut tiles carefully** using the correct cutter and keeping fingers clear.
- **Take care with paste** and wet floors – keep the area clean and dry.



Before you finish

Accuracy: Check your work, measurements and finish.
Safety: Ensure the area is safe, tools are put away and no spills.
Quality: Look for a neat, professional finish with no damage or missed areas.

Year 9 Hospitality & Catering Knowledge Organiser

Ingredients, nutrition and essential facts



COURSE FOCUS

Learning focus and essential facts

Apply food science, food safety and sustainability. The danger zone for rapid bacterial growth is about 5°C to 63°C. Fridges should operate at 5°C or below and freezers at about -18°C. Food production includes growing, processing, transport, cooking and disposal. Use the 6 Rs to reduce environmental impact.

Food groups, nutrients and functions

Macronutrients: support health but provide no energy.

High-risk foods: moist, protein-rich foods that need strict temperature control.

Aeration: adds air. **Shortening:** fat limits gluten for a crumbly texture.

Coagulation: proteins set. **Gluten formation:** mixing flour and liquid creates an elastic network.

Seasonal and local food: can reduce transport and support producers.

KEY INFORMATION VISUAL



Year 9 Hospitality & Catering Knowledge Organiser

Equipment, processes, vocabulary and quality



Electric whisk



Dough mixing



Temperature control



Assured standards

Practical processes

Mechanical aeration: whisking traps air. **Ribbon stage:** whisked egg mixture briefly holds its shape. **Folding:** combines ingredients without losing air. **Lamination:** creates layers of dough and fat. **Piping:** pushes mixture through a shaped nozzle. **Gluten extraction:** washes starch from dough. **Denaturation:** protein chains unfold. **Coagulation:** they bond and set. Too much heat causes **overcoagulation** or curdling.

Keywords and quality

Emulsification: helps oil and water stay mixed. **Vegetarian:** avoids meat and fish. **Vegan:** avoids animal products. **Coeliac disease:** immune reaction to gluten. **Lactose intolerance:** difficulty digesting milk sugar. **A la carte:** dishes priced separately. **Table d'hôte:** limited courses for a fixed price. **Food miles:** distance food travels.

Accuracy and quality: Control temperature, time, ratios and portion size. Explain how ingredient functions produced the final texture and judge whether the dish reduced waste and met the intended need.

Health, hygiene and safe food preparation

CONDITIONS NEEDED FOR BACTERIAL GROWTH

Conditions for bacteria growth:

Warmth

Food

Moisture

Time

To effectively prevent bacterial contamination and keep food safe, practice the 4 Cs: Clean, Chill, Cook, Cross-contamination

Safety and hygiene rules

Bacterial control: limit time in the danger zone, chill at 5°C or below and reheat until steaming.

Food probe: disinfect before and after use; test the thickest part without touching the tray.

Allergens: check labels, record ingredient changes and prevent cross-contact.

Responsible working: plan portions, store ingredients correctly, use leftovers safely and separate recyclable or compostable waste.

Sensory vocabulary

Five tastes: sweet, sour, salty, bitter and umami. Anosmia means loss of smell. Orthonasal aroma enters through the nose; retronasal aroma travels from mouth to nose.

Allergens

UK food businesses identify 14 regulated allergens. Check every label, prevent cross-contact and record ingredient changes.

Sustainability

Use the 6 Rs, plan portions and use leftovers safely. Seasonal and local choices may reduce transport, but production and storage also affect impact.

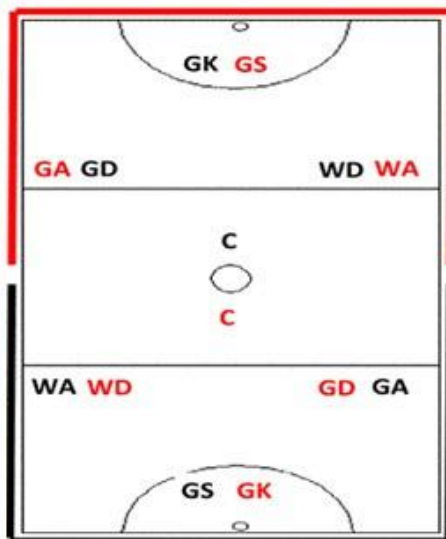


PE

<https://www.youtube.com/watch?v=8XISfjXXakQ>

Cycle 1 Knowledge Organiser

Basic netball rules video



Basic Rules

Players: Only 7 players per side, who all have different positions

Contact rule: You can't touch or push any player during the game as it is a non-contact sport. **This will result in a penalty pass or if they contact you whilst you are in the shooting circle, you will get a penalty shot.**

Footwork rule: You are not allowed to move with the ball. When catching the ball the foot that lands first must stay in contact with the floor until ball is passed. **If footwork happens a free pass is awarded.**

Obstruction rule: you must be 1 metre away from the player you are marking before your arms go up and over the ball. **If your defender is obstructing you before you shoot, you get a penalty shot.**

3 seconds rule: You can only hold the ball for 3 seconds before you pass or shoot. **If a player holds a ball to long a free pass is awarded.**

Centre pass rule: To start a game and after a goal is scored you go back to the centre pass and players must receive in the centre third.

Repossession: If a player drops the ball or bounces the ball and picks it back up again the other team gets a free pass.

Offside rule: If you go into a third that you are not allowed in or if any other player than GS GA GK GD go into the shooting circle the other team gets a free pass. **If offside happens a free pass is awarded.**

How to score: A goal is scored when a GA or GS gets the ball into the hoop from within the D.

Out of court: If the ball gets knocked out of the court by team A, then team B will gain the throw in.

Key components of a warm up

Pulse Raiser

Exercises that slowly increase heart rate and body temperature. E.g. **A netballer jogging for 5 minutes around the court.**

Dynamic Stretching

Placing the body into a position where the muscle or group of muscles is put under tension. E.g. **A netball player doing lateral lunges**

Mobility

Exercises that take the joints through their full range of movement (ROM). E.g. **A netball player doing open/close the gate.**

Skill Rehearsal

Rehearsing common movement patterns and skills which will be used in the activity E.g. **A netball player shooting.**

Major Sporting Events

Regular

An event that is annual (held each year) or biennial (every 2 years) which is held in different city each year. E.g. **Annual = the UEFA Champions League. Biennial = the Ryder Cup.**

One-Off

An event held only once or very occasionally in a city or country. E.g. **The Olympics**

Regular and Recurring

An event that happens around the same time each year and hosted in the same place E.g. **Wimbledon.**

Positives aspects of hosting a Major Sporting Event:

- Global attention on the country
- Improved transport to facilities
- Increased income from sponsorship
- More jobs to build and run the events.

TBAT understand rules of netball and identify major sporting events and how to warm up effectively

Cycle 1 Knowledge Organiser

Basic rugby rules video



Basic Rules

The object of the game is score more points than your opponents in the 80 minute time frame allotted for each rugby match.

Tackling: cannot be made above sternum height or by tripping a player with your feet. Once a tackle is made the player must let go of the ball.

Knock ons If the ball is dropped or deflected forward by a player from their hands, this is classed as a knock on.

Offside Attacking players must be behind the ball to stay remain onside in rugby.

Lineout A lineout is called if the ball travels past the sideline ('in touch').

Scrumming The scrum is used to restart play after a number of rule breaks, including; knock ons, accidental offside or the ball being passed forwards.

- Keep the spine straight
- Elbows in
- Hips inline with shoulders

Rucking After a tackle, the players can form a ruck to gain possession of the ball. This is where the tackled player presents after a tackle, while the players from both teams contests the ball on their feet.

- Place the ball on the floor, Drive over the ball player, Leave the ball on the ground, Keep driving to obtain ball.

A try Teams can score a try by grounding the ball in the defending 'in goal area'. The player who grounds the ball must have it under control. This is worth 5 points.

Key components of a warm up

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LANGUAGES

FRENCH | SPANISH

Learning Cycle 1 is about relationships. You will revise the present tense and the near future tense and learn about reflexive verbs to discuss relationships and adjectives to describe people.

Key words	Definitions
Subject Pronouns	Whoever is doing the action : Je (I) / Tu (you) / Il/Elle (he/she), Nous (we) / Vous (you (pl)) / Ils/Elles (they (m)/they (f))
Nouns	Used to identify any of a class of people, places, or things
Adjectives	Used to describe a noun
Adjectival agreement	In French, adjectives 'endings have to change according to the noun they describe
Verbs	A word used to describe an action, state, or occurrence, and forming the main part of the predicate of a sentence, such as <i>hear, become, happen</i> .
To conjugate	To change the ending of a verb so it fits in a sentence
Infinitive	A verb in its unchanged form / A verb which can be found in a dictionary / A verb which has an ER/IR/RE ending in French (jouer) / A verb which has 'to' in front of it in English (to play)
Present tense	Used to say what someone is currently doing or usually does (I play / I am playing)
Near Future	Used to describe what you are going to do in the future (I am going to play)
Past tense	Used to talk about a completed action which took place in the past

G Adjectival agreement: irregular adjectives > Page 214

Most adjectives add **-e** when used with feminine nouns. However, some adjectives are different.

Some never change: *un copain **sympa**/une copine **sympa***.
Adjectives that already end in **-e** don't add an extra **-e** for feminine nouns: *un copain **sensible**/une copine **sensible***.

Some change in different ways:

*un copain gentil → une copine **gentille***

*un copain **compréhensif** → une copine **compréhensive***

*un copain **généreux** → une copine **généreuse***

G Adjectival agreement > Page 214

Most adjectives work like this:

masculine	feminine	masc plural	fem plural
no ending	add -e	add -s	add -es
e.g. <i>charmant</i>	e.g. <i>charmante</i>	e.g. <i>charmants</i>	e.g. <i>charmantes</i>

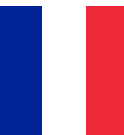
- **Reflexive verbs** are verbs that have an extra reflexive pronoun in front of the verb. The verb itself might be regular or irregular, and is conjugated as usual. The reflexive pronoun agrees with the subject of the verb.
e.g. ***se** disputer* (to argue):

*je **me** dispute nous **nous** disputons*

*tu **te** disputes vous **vous** disputez*

*il/elle/on **se** dispute ils/elles **se** disputent*

NB *me, te* and *se* shorten to *m', t' and s'* before a vowel or *h* e.g. *Je **m'**appelle Yannick*.



	masculine	feminine	plural
my	mon	ma	mes
your	ton	ta	tes
his/her	son	sa	ses

Je pense que...	I think that...
Je crois que...	I think that...
A mon avis...	In my opinion...
Selon moi...	For me...
Personnellement...	Personally...
Je trouve...	I find... (something e.g. football) (adjective e.g. fun)
J'aime...	I like...
J'adore...	I love...

FUTUR PROCHE

ALLER (PRÉSENT) + INFINITIF

JE VAIS TU VAS IL/ELLE VA NOUS ALLONS VOUS ALLEZ ILS/ELLES VONT	NAGER CHANTER PARLER MANGER DESSINER SE PROMENER
--	---




IL VA DESSINER UN CHATEAU ILS VONT CHANTER UNE CHANSON

ATTENTION! À LA FORME NÉGATIVE:

NE + ALLER + PAS + INFINITIF

JE NE VAIS PAS CHANTER

REGULAR PRESENT TENSE			
	-ER	-IR	-RE
Je	e	is	s
Tu	es	is	s
Il/Elle/On	e	it	
Nous	ons	issons	ons
Vous	ez	issez	ez
Ils/Elles	ent	issent	ent

Negatives

- Ne pas - Not
- Ne jamais - Never
- Ne plus - Not any more
- Ne que - Only

The present tense: avoir and être

> Page 202

These are the two most useful verbs in French.

avoir	to have	être	to be
j'ai	I have	je suis	I am
tu as	you have	tu es	you are
il/elle/on a	he/she has; we have	il/elle/on est	he/she is; we are
nous avons	we have	nous sommes	we are
vous avez	you have	vous êtes	you are
ils/elles ont	they have	ils/elles sont	they are

Intensifiers



- un peu - a bit
- plutôt - rather
- assez - quite
- très - very
- vraiment - really

Frequencies



- Rarement - rarely
- Quelquefois - sometimes
- Souvent - often
- Normalement - normally
- De temps en temps - From time to time
- D'habitude - Usually

Learning Cycle 1 is Mi Gente – talking about friends; family and relationships.
Use these keywords and phrases alongside your Learning Cycle Vocabulary

Key words	Definitions
Subject Pronouns	yo (I) / tu (you) / el/ella (he/she), nosotros (we) / vosotros (you (pl)) / ellos/ellas (they (m)/they (f))
Nouns	Naming words
Adjectives	used to describe a noun
Verbs	Doing words. Used to describe an action, state, or occurrence, and forming the main part of the predicate of a sentence, such as <i>hear, become, happen</i> .
Adverbs of frequency	used to say how often someone does something
Infinitive	The 'to do' bit of a verb / A verb which has an AR/ER/IR ending in Spanish (to play - jugar)
Present tense	Used to say what someone is currently doing (I do - hago / I play - juego)
Past tense	Used to talk about a completed action which took place in the past (I went - fui/ I ate - comí)
Imperfect tense	Used to talk about an action in the past which took place regularly (I used to play football on Saturdays – antes jugaba fútbol los sábados)
The Future tense	Used to talk about what someone will do in the future (I will play football – jugaré al fútbol)
The Near Future tense	Used to talk about what someone is going to do in the future (I am going to play football – voy a jugar al fútbol)
The Conditional Tense	Use when you want to say would / should or could (I would like – me gustaría jugar al fútbol)

Opinions

Creo que / Pienso que / Opino que	I think that
Me parece que	It seems to me that
Para mí	For me
Lo bueno / mejor es que	The good/best thing is that
Lo malo / peor es que	The bad/worst thing is that
Lo que más me gusta/gustó	The think I like/liked most



Justifications

porque / ya que	because
dado que	given that
además	also
sin embargo / no obstante	however
pero	but



Connectives

y / o	and/or
también	also
por eso / así que / por lo tanto	therefore
primero / luego / después	firstly / then / after
a menudo	often
sobre todo	especially
a causa de / gracias a	because of / thanks to
a pesar de	in spite of



Common verbs

Soy	I am	Tengo	I have
Eres	You are	Tienes	You have
Es	He/she is	Tiene	He/she is



G Adjectival endings Page 210

Adjectives in Spanish usually come after the noun and 'agree' with the noun they describe. You have seen the -o/-a, -e, and consonant endings already. Adjectives endings in -or/-ora and -ista follow a slightly different pattern.

adjective ending	masculine singular	feminine singular	masculine plural	feminine plural
-o/a	serio	seria	serios	serias
-e	inteligente	inteligente	inteligentes	inteligentes
consonant	fiel	fiel	fieles	fieles
-or/ora	hablador	habladora	habladores	habladoras
-ista	optimista	optimista	optimistas	optimistas

G The present continuous Page 206

	estar (to be)	present participle
(yo)	estoy	
(tú)	estás	mirando
(él/ella/usted)	está	bebiendo
(nosotros/as)	estamos	escribiendo
(vosotros/as)	estáis	
(ellos/ellas/ustedes)	están	

To form the present participle, take the infinitive, remove the -ar, -er or -ir and add the endings: **-ando, -iendo, -iendo**.

Estoy buscando canciones. I am looking for songs.
Está jugando al fútbol. He/She is playing football.

Irregular present participles include: leer → **leyendo**, dormir → **durmiendo**

G Para + infinitive

Use **para** to mean 'in order to...' or 'for -ing'. It is followed by the **infinitive**.

Uso YouTube **para pasar** el tiempo.
 I use YouTube **in order to pass** the time.

Es una aplicación muy buena **para descargar** música.
 It is a very good app **for downloading** music.

★ Structure your writing:

primero (first of all)
 además (furthermore)
 sin embargo (however)
 por otro lado (on the other hand)
 ya que (because / as)
 por eso (so)

G Ser and estar

Ser is used for:
Description: Soy alto. Soy honesto.
Origin: ¿Eres de Colombia?

Estar is used for:
Position: Estoy en la playa.
Action: Está estudiando.
Condition: Estamos cansados.
Emotion: Están contentos.

G Reflexive verbs for relationships Page 201

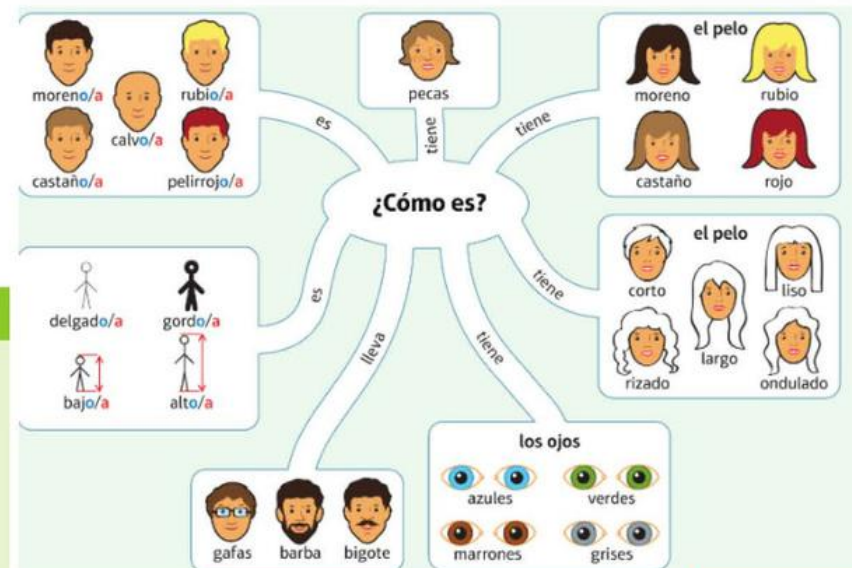
Some verbs for describing relationships are reflexive in Spanish.

	llevarse (to get on)	
(yo)	me llevo	
(tú)	te llevas	
(él/ella/usted)	se lleva	bien con...
(nosotros/as)	nos llevamos	mal con...
(vosotros/as)	os lleváis	
(ellos/ellas/ustedes)	se llevan	

Me llevo bien con mis padres. I get on well with my parents.

These include: **pelearse** (to argue) and **divertirse** (to have fun).
Me peleo con mi hermano. I argue with my brother.
Me divierto con mi mejor amiga. I have fun with my best friend.

★ Make your speaking more interesting by using a variety of adjectives and use adverbs to add detail: *siempre, a veces, de vez en cuando, nunca...*



★ Use **muy** (very), **bastante** (quite) and **un poco** (a little) to qualify your descriptions.

E.g. **Tiene el pelo muy largo.**

Remember that **poco** (little) is used to mean 'not very much'.

E.g. **Tiene poco pelo.**

G Possessive adjectives Page 221

Most possessive adjectives have two forms, singular and plural:

	singular	plural
my	mi	mis
your (singular)	tu	tus
his/her/its	su	sus
our	nuestro/nuestra	nuestros/nuestras
your (plural)	vuestro/vuestra	vuestros/vuestras
their	su	sus

Nuestro (our) and **vuestro** (your - plural) also have masculine and feminine forms:

nuestros hermanos our brothers
vuestras hermanas your sisters

