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# English - The Genre of Tragedy: A study of Hamlet

## Tragedy as a Genre

A tragedy can be defined simply as a play that has a sad and depressing ending. Whilst not a definitive list, the key features outlined below are often present.

### TRAGEDY

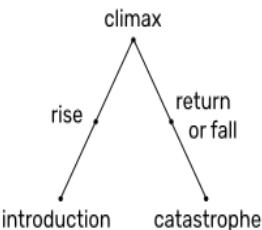
1. The action moves towards catastrophe, which could involve a sudden reversal of the hero's fortunes from happiness to misery and culminating almost invariably in his death.
2. The hero will be an individual of some high rank or status—a king or prince whose fall involves the fate of a whole nation. (Though in England in the eighteenth-century a tradition of 'bourgeois' or 'domestic' tragedy emerges. And compare in our own period the appearance of the tragic 'anti-hero'.)
3. The hero is neither pre-eminently virtuous nor completely evil: the reversal of his fortune is brought about by some tragic flaw in his character or 'error of judgement'.
4. The hero is therefore involved in a struggle against fate or the hostility/indifference of the gods or a malign set of circumstances which exposes the hero's vulnerability, and his suffering moves us because it is incommensurate with his faults.
5. Because of the stature and nature of the hero, he compels our attention—and probably our identification with his plight.
6. Courage and endurance in the face of inevitable defeat are the predominant notes. It may be that through the agency of suffering the hero is brought to some measure of self-knowledge: often on the very brink of death he will see his situation as it really is.
7. The play finally arouses in an audience 'pity and fear, wherewith to accomplish the catharsis of such emotions'—the famous Aristotelean formulation. Catharsis suggests a purging or a purification of feeling. Certainly we experience a sense of waste at the end of a tragedy, though this will probably be combined with a feeling of elevation at having witnessed a sublime struggle, mediated to us in the form of a profound aesthetic experience, from which we derive insights transcending our mundane experience.
8. The style is in keeping with the intensity and grandeur of the action. The characteristic medium is dramatic poetry.

## The structure of a tragic play

As long ago as 350 BC, Aristotle famously wrote that a play must have a beginning, a middle, and an end, which is the beginning of structure.

According to Aristotle the beginning of a play consists of the presentation of a character, someone the audience can identify with. That is a beginning – an opening, a first act. The character makes a decision and performs an action, which moves the play on. That action has consequences, and so it goes on, until that initial action results in a climax, followed by a reversal and then a resolution. All that will make the audience hold its breath and then release it at the end in a kind of catharsis. From that one can see a structure, which we still have in drama today – regardless of the number of acts used in print. Aristotle certainly did not divide the action into five sections. It was the Roman critic, Horace, three hundred years after Aristotle, who advocated that, and by the beginning of the first century in Rome it had become conventional. All Seneca's plays were structured in five separate acts with musical interludes between them.

Fast-forward to the sixteenth century and most plays were written in this five act structure. If they weren't, later editors of works such as Romeo and Juliet would divide the plays into five parts so as to fit Seneca's structure.



Word	Definition
Vengeance	An action against someone to punish them for having hurt you.
Heroic	Behaving like a hero; admirably brave or determined.
Fury	Wild or violent anger.
Boasted	Talked with excessive pride and self-satisfaction about one's achievements or possessions.
Sacred	Religious; above other things.
Weary	Showing extreme tiredness.
Mystique	The quality of mystery; an air of secrecy that makes something seem powerful.
Constricted	Narrowed, inhibited, restricted.
Abomination	a thing that causes disgust or loathing.
Purity	Freedom from contamination; clean.
Aside	An aside is not spoken to the other characters on stage
Blank Verse	Blank verse is verse that does not rhyme
Catalyst	The definition of a catalyst is someone or something that speeds up or brings about an event
Catharsis	Feelings of pity and fear felt by the audience, for the inevitable downfall of the protagonist.
Chorus	The chorus in a play provides commentary on actions and events that were taking place before the audience.
Denouement	The denouement is the resolution of a plot that occurs after its climax. This is usually at the end of the text.
Dramatic Irony	This is when the audience knows something the characters don't
Hamartia	A tragic flaw, error or mistake that causes the downfall of a hero
Hubris	Excessive pride and disrespect for the natural order of things.
Malcontent	A person who is dissatisfied and rebellious
Pathos	Pathos appeals to the emotions of the audience and elicits feelings that already reside in them.
Soliloquy	An act of speaking one's thoughts aloud when by oneself or regardless of any hearers, especially by a character in a play.
Tragedy	A branch of drama that treats in a serious and dignified style the sorrowful or terrible events encountered or caused by a heroic individual.



Plot	HAMLET
Act 1, Scene 1	Roderigo is unhappy with Iago for failing to promote his marriage to Desdemona, who has secretly married Othello. Iago speaks of his hatred of Othello and seeks revenge on him. Iago and Roderigo tell Brabantio of Desdemona's elopement. Brabantio is furious and sets out to locate the couple.
Act 1, Scene 2	Iago, who feigns loyalty, warns Othello that Brabantio may have Othello arrested. Othello is confident that his reputation makes him a suitable match for Desdemona. Cassio informs Othello that he is required at a meeting of the Venetian council. Brabantio accuses Othello of bewitching Desdemona. Brabantio attends the council meeting too.
Act 1, Scene 3	Othello is told to prepare for war against the Turks after their invasion of Cyprus. He recounts his history of his relationship with Desdemona and she is brought to the council chamber to confirm his words. Desdemona asks permission to accompany Othello on his military campaign. Brabantio warns Othello against trusting Desdemona. Iago says he will help Roderigo cuckold Othello.
Act 2, Scene 1	All characters arrive in Cyprus. Othello is overjoyed to be reunited with Desdemona. Iago persuades Roderigo to provoke Cassio in the hope of discrediting him. Iago reiterates his desire to have revenge on Othello and Cassio as he suspects them both of cuckolding him.
Act 2, Scene 2	Peace is restored in Cyprus. There is to be a night that celebrates the destruction of the Turkish fleet and Othello's marriage.
Act 2, Scene 3	Desdemona and Othello leave to consummate their marriage. Iago persuades Cassio to get drunk. Roderigo antagonises Cassio and they fight. Othello dismisses Cassio from his post. Iago advises Cassio to seek help from Desdemona. Iago explains how he is going to poison Othello's mind by suggesting that Cassio has cuckolded him.
Act 3, Scene 1	Cassio hires musicians to serenade Othello and Desdemona. Iago plans to divert Othello's attention so that Cassio can speak with Desdemona alone and Emilia agrees to help.
Act 3, Scene 2	Othello sets out to inspect the fortifications in the town with Iago at his side.
Act 3, Scene 3	Desdemona agrees to help Cassio and pleads with Othello to reinstate him. Iago hints that Cassio has committed adultery with Desdemona. Othello doubts Desdemona and becomes jealous. Desdemona drops her handkerchief, which Emilia picks up and gives to Iago. Othello demands proof of the affair. Iago describes a dream where Cassio called out for Desdemona and says he has seen Cassio with the handkerchief. Othello asks Iago to kill Cassio and he promotes Iago. Othello intends to kill Desdemona.
Act 3, Scene 4	Desdemona is uneasy about losing the handkerchief. She tries again to get Othello to reinstate Cassio. Othello demands to see the handkerchief. Bianca is annoyed with Cassio as he has not visited her so he gives her Desdemona's handkerchief that he found in his room.
Act 4, Scene 1	Iago torments Othello with crude images of Desdemona's infidelity and he falls into a fit. Iago has a conversation with Cassio about Bianca but Othello watches and thinks it is about Desdemona. Othello sees the handkerchief in Bianca's hand and vows to murder his wife. Venetian visitors bring news that Cassio is to replace Othello. Othello strikes Desdemona.
Act 4, Scene 2	Othello questions Emilia about Desdemona and Cassio, but doesn't believe her when she says that Desdemona is true to him. Othello tries to get Desdemona to confess. Iago persuades Roderigo to kill Cassio.
Act 4, Scene 3	Othello sends Desdemona to prepare for bed. She sings a melancholy song whilst Emilia expresses her wishes that Desdemona had never met Othello. The women talk of infidelity.
Act 5, Scene 1	Cassio wounds Roderigo, then Iago stabs Cassio in the leg. Iago kills Roderigo. Iago accuses Bianca of involvement in a plot to kill Cassio. Emilia goes to inform Othello and Desdemona of what has happened.
Act 5, Scene 2	Desdemona sleeps and Othello explains he will kill her despite still loving her. Emilia is horrified at seeing Desdemona's body, but she revives briefly and says she caused her own death. Emilia reveals Iago's villainy so he stabs her and she dies next to Desdemona. Iago refuses to explain his actions. Othello kills himself.

Characters	
Othello	Main protagonist, a Moor who is a successful mercenary general, believes Iago's false tales of his wife's adultery.
Desdemona	A wealthy young Venetian woman who secretly marries Othello.
Iago	The play's antagonist and Othello's ensign who seeks to destroy Othello.
Emilia	Iago's wife and Desdemona's lady in waiting in Cyprus.
Cassio	Florentine soldier, who is promoted to lieutenant. Othello believes that he has committed adultery with Desdemona. He is made governor of Cyprus at the end of the play.
Brabantio	A Venetian senator and Desdemona's father.
Roderigo	A wealthy Venetian gentleman who had hoped to marry Desdemona. Iago uses him to help in his mission to destroy Othello, but then kills him.
Bianca	A courtesan, who is in love with Cassio.
Montano	Governor of Cyprus before Othello takes over.
Lodovico	A noble Venetian and Desdemona's cousin.

Themes	
Jealousy	
Love, marriage and relationships	
Race and colour	
Gender	
Power and position	
Pride and reputation	
Appearance and reality	
Hatred and revenge	
Femininity and masculinity	

Vocabulary	
aside	
blank verse	
catalyst	
catharsis	
chorus	
denouement	
dramatic irony	
hamartia	
hubris	
Jacobean drama	
Machiavell	
malcontent	
pathos	
soliqouy	
tragedy	

**Context**

**Shakespeare's drama and the Renaissance**— Classical texts and culture of Greece and Rome were rediscovered resulting in the 'golden age' of English Literature to begin, in which Shakespeare's plays are part. This often promoted a curiosity in thought which challenged old assumptions and traditions.

**Attitudes towards race**— Elizabethans were against mixed marriage and viewed Negroes and 'blackamoors' with suspicion. Elizabeth I issued edicts demanding their removal from England in 1601 because they were considered an 'annoyance'. Many believed that they were only fit to be slaves.

**Religion**— The nationalism of the English Renaissance was reinforced by Protestantism. Shakespeare's plays are free from direct religious sentiment, but their emphases are Protestant.

**Female subordination**— Women expected to be ruled by men. Many men saw women as possessions, and fathers expected to choose husbands for their daughters. They were believed to be intellectually inferior to men and incapable of rational thought and rarely received an education. Assertive and argumentative women were seen as a threat to the social order and were punished with forms of torture. Domestic abuse was common and except in cases of extreme cruelty, not considered unacceptable. Shakespeare is thought to have included a large number of parts for strong-minded women in his plays.

**Setting**— The military events of the play are based on historical facts. Turkey launched an attack on Cyprus, which was governed by Venice at the time.

**Venice** was a popular Elizabethan setting for plays about intrigue, love, affairs and revenge. It had a reputation of wealth and sophistication, but was also perceived as a place of loose morals.

**Cyprus**, a geographically isolated setting, is the 'warlike island' that is used to mirror the tragic events of the play.

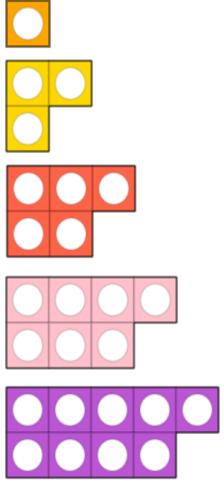
**Stage history of 'Othello'**— The first recorded performance was at the Banqueting House at Whitehall in London on 1<sup>st</sup> November 1604 and was attended by James I. A white actor with black make-up would have played Othello. Ira Aldridge was the first documented black actor to play Othello in 1833.

**Tragedy**— Aristotle (384 – 322 BCE) listed various aspects that he thought a play needed to be considered a true tragedy.

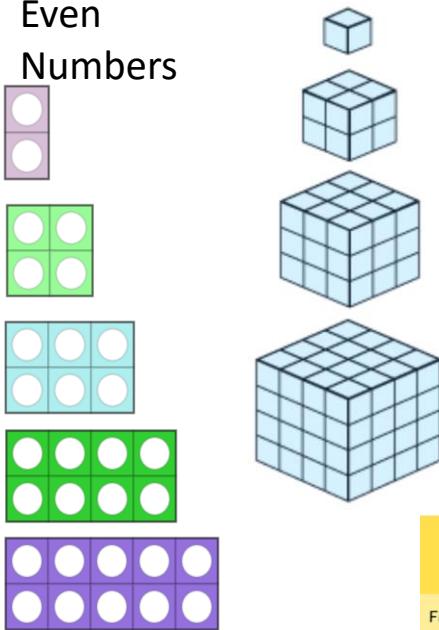
**Seneca** (4 BC to 69 AD) popularised the idea of revenge in tragedy and introduced the inclusion of villains within them.



## Odd Numbers



## Even Numbers

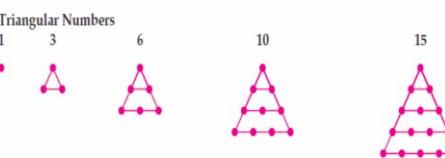


1 is the first cube number.  
because  $1 \times 1 \times 1 = 1$

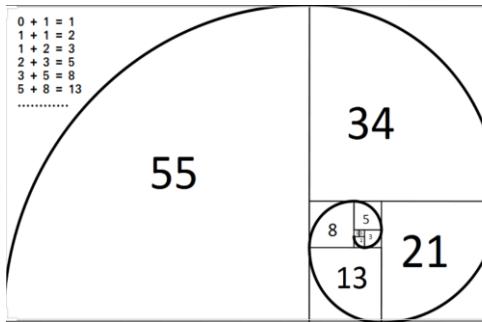
8 is the second cube number,  
because  $2 \times 2 \times 2 = 8$

27 is the third cube number,  
because  $3 \times 3 \times 3 = 27$

64 is the fourth cube number,  
because  $4 \times 4 \times 4 = 64$



## Fibonacci Sequence



A natural number greater than 1 with no divisors other than 1 and itself.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Remember these facts about Prime Numbers!

There are no even numbers except 2.

There are no prime numbers ending in 5, except 5.  
The digits can't add up to 3 except 3 (digital root).

## Types of Numbers

### Factors & Multiples

Find the different factors of a number by working out which numbers divide into it evenly.

What are all the factors of 12?

$$12 \div 1 = 12$$

1 | 12

$$12 \div 2 = 6$$

2 | 12

$$12 \div 3 = 4$$

3 | 12

The factors of 12 are:  
1, 2, 3, 4, 6, 12

Multiples appear in the number's multiplication table. You can calculate them by counting on by that number.

What are all the multiples of 12?

$$12 \times 1 = 12$$

12 | 12

$$12 \times 2 = 24$$

12 | 24

$$12 \times 3 = 36$$

12 | 36

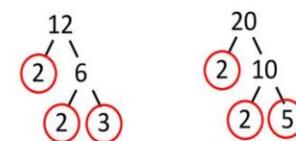
$$12 \times 4 = 48$$

12 | 48

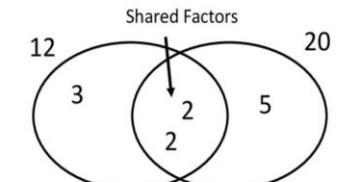
The multiples of 12 include:  
12, 24, 36, 48...

Find the Highest Common Factor (HCF) & Lowest Common Multiple (LCM) of 12 & 20.

1) Complete Prime Factorisation for both numbers.



2) Input the Prime Factors into a Venn diagram



3) HCF = Product of shared factors

$$2 \times 2 = 4$$

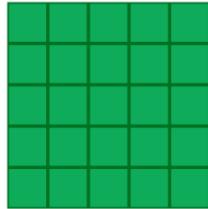
$$12 = 2 \times 2 \times 3$$

$$20 = 2 \times 2 \times 5$$

4) LCM = Product of all factors in the diagram

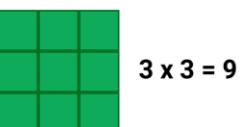
$$2 \times 2 \times 3 \times 5 = 60$$

1 x 1 = 1



5 x 5 = 25

2 x 2 = 4



3 x 3 = 9

6 x 6 = 36

7 x 7 = 49

8 x 8 = 64

9 x 9 = 81

10 x 10 = 100

11 x 11 = 121

12 x 12 = 144

4 x 4 = 16

**Da Vinci Academy**  
A L.E.A.D. Academy

# Mathematics

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
3	2	8	7	2	6	3

Place value of 3 = 3,000,000  
 Place value of 2 = 200,000  
 Place value of 8 = 80,000  
 Place value of 7 = 7,000 → 3 2 8 7 2 6 3  
 Place value of 2 = 200  
 Place value of 6 = 60  
 Place value of 3 = 3

1 < 3      2 = 2      3 > 1

## COMPARING & ORDERING DECIMALS

**STEP 1:** Stack the numbers being compared. Line up the decimal points.

4.8	4.800
4.826	4.826
4.08	4.080
4.006	4.006

**STEP 2:** Add zeros so that each number has the same number of decimal digits.

4.8	4.800
4.826	4.826
4.08	4.080
4.006	4.006

**STEP 3:** Compare each place value one by one. If a number is the same, move to the next place.

↓ ↓ ↓ ↓	
4.800	
4.826	
4.080	
4.006	

**STEP 4:** Order the numbers from least to greatest or greatest to least. Here, they are ordered from least to greatest.

4.006, 4.080, 4.800, 4.826

Remove the zeros you previously added.

4.006, 4.08, 4.8, 4.826

### Rounding to the nearest 10

Here is a numberline showing the numbers from 20 to 30.

To round without a number line:

- Identify the tens digit.  
3 2 6 The tens digit is 2, or 20.
- Work out the next ten up.  
3 2 6 is between 320 and 330
- Decide if it stays or rounds up.  
3 2 6 Use the units digit to decide. "5 or more rounds up", so 6 will round up to the next 10.  
326 → 330

You might sometimes hear the rule "5 or more rounds up".

### Rounding to whole numbers

Here is a numberline showing the numbers from 15 to 16.

To round without a number line:

- Identify the units digit.  
6.42 The units digit is 6.
- Work out the next unit up.  
6.42 is between 6 and 7
- Decide if it stays or rounds up.  
6.42 Use the tenths digit to decide. "5 or more rounds up", so 4 will stay down.  
6.42 → 6

You might sometimes hear the rule "5 or more rounds up".

### Rounding to decimal places

Rounding to decimal places is exactly like rounding whole numbers - you just have more numbers (and therefore greater accuracy).

3.248	3.248 rounded to 1 d.p.
3 is the units digit. 2 is worth 2 tenths, and is the first decimal place. 4 is worth 4 hundredths, and is the second decimal place. 8 is worth 8 thousandths, and is the third decimal place. You will sometimes see "decimal place" shortened to "d.p."	3.248 → 3.2 1 <sup>st</sup> dp 3.2 Look at the next digit. 4 stays down - stay at 3.2.

3.248	3.248 rounded to 2 d.p.
3.248	3.248 → 3.25 2 <sup>nd</sup> dp 3.24 Look at the next digit. 8 rounds up - go to 3.25

### Significant figures

If something is **significant**, it is big or important. The **most significant** thing is the biggest or most important thing.

3268	3268 rounded to 1 sig. fig.
3268	3268 → 3000 1 sf 3000 Look at the next digit. 2 is less than 5 - stay at 3000

3268	3268 rounded to 2 sig. fig.
3268	3268 → 3300 2 sf 3200 Look at the next digit. 6 rounds up - go to 3300

### Estimating

Billy can write 24 words a minute. Estimate how long it took him to write 643 words.

When estimating, we first need to round **EVERY** number in the question to one significant figure.

We round 24 to 1 s.f.      20  
 We round 643 to 1 s.f.      600  
 $643 \div 24 \square 600 \div 20 = 30 \text{ minutes}$

**Index, power or exponent**

**Base**

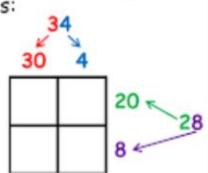
5<sup>2</sup>

How to say it: five to the power of 2

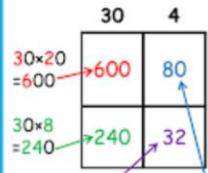
## Multiplication: The grid method

The grid method is a useful starting point when first learning to multiply. However, it can get complicated with large numbers.

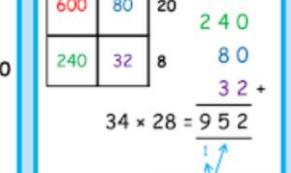
**Step 1**  
To work out  $34 \times 28$ ... split each number into tens and units, and write next to a grid like this:



**Step 2**  
Use times tables to fill in the grid. Take care with the number of zeros needed!



**Step 3**  
Add up the numbers inside the grid.



## Written Methods for Division

**SHORT DIVISION:**

0	4	2		
6	2	5	1	2

**SHORT DIVISION with remainders:**

1	2	5	5	
2	2	5	1	0

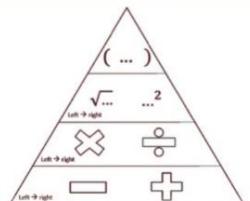
**LONG DIVISION:**

0	4	2	
6	2	5	2
-	2	4	0
0	1	2	
-	0	1	2
0			

This method relies on you being comfortable with multiples of your divisor (in this case, 6).

Continue after the decimal point! If you start to get a repeating decimal, stop.

## Order of Operations



**Example 1**  
 $(4 \times 7) + 3$   
So we need to evaluate the brackets first;  $4 \times 7 = 28$   
This is now  $28 + 3 = 31$

**Example 2**  
 $(6 + 4 - 3)^2 \times 4$   
So we need to evaluate the brackets first and we work left to right;  $6 + 4 - 3 = 7$   
This is now  $7^2 \times 4 = 49 \times 4 = 196$

**Example 3**  
 $4 - 8 \times 2 + 12 \div 4$   
So first we do the multiplication/division left to right;  $4 - 16 + 3$   
Now we do the addition/subtraction from left to right;  $-12 + 3 = -9$

**on a calculator**  
39% of 82  
 $0.39 \times 82$  Change to a decimal and multiply

**increasing**  
Increase £60 by 12%  
 $12\% \text{ of } 60 = 0.12 \times 60 = £7.20$   
New amount =  $£60 + £7.20 = £67.20$  ADD

**fraction to %**  
 $\frac{15}{20} = \frac{75}{100} = 75\%$  OR  
 $15 \div 20 \times 100 = 75\%$

**Percentages**

**decreasing**  
Decrease £60 by 12%  
 $12\% \text{ of } 60 = 0.12 \times 60 = £7.20$   
New amount =  $£60 - £7.20 = £52.80$  SUBTRACT

**without a calculator**  
50% - half  
25% - half and half  
75% - 50% + 25%

10% - divide by 10  
5% - half 10%  
20% - double 10%

### Adding Fractions

**Adding Fractions with Like Denominators**

$\frac{1}{7} + \frac{3}{7}$   
Add the numerators.  
Denominator is unchanged.

**Adding Fractions with Unlike Denominators**

$\frac{1}{8} + \frac{2}{3}$   
Rewrite with common denominator  
 $3 \times \frac{1}{8} + \frac{2 \times 8}{3 \times 8}$

$\frac{3}{24} + \frac{16}{24}$   
Add the numerators

**Example 3**  
Dividing fractions – invert and multiply

To divide fractions take the reciprocal (invert the fraction) of the divisor and multiply the dividend.

Invert the fraction that you are dividing by  
 $\frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2}$

Multiply the numerators and denominators  
 $\frac{4}{5} \times \frac{3}{2} = \frac{12}{10}$

Simplify the fraction if necessary  
 $\frac{12}{10} = 1\frac{1}{5}$

Fraction	Percent	Decimal
1	100%	1.0
$1/2$	50%	0.5
$1/3$	33.3%	0.33
$1/4$	25%	0.25
$1/5$	20%	0.2
$1/6$	16.6%	0.166
$1/8$	12.5%	0.125
$1/10$	10%	0.1
$1/12$	8.3%	0.083

The three steps of multiplying fractions

Solve:  $\frac{2}{6} \times \frac{9}{16}$

Step 1. Multiply the top numbers:

$$\frac{2}{6} \times \frac{9}{16} = \frac{2 \times 9}{6 \times 16} = \frac{18}{96}$$

Step 2. Multiply the bottom numbers:

$$\frac{2}{6} \times \frac{9}{16} = \frac{2 \times 9}{6 \times 16} = \frac{18}{96}$$

Step 3. Simplify the fraction:

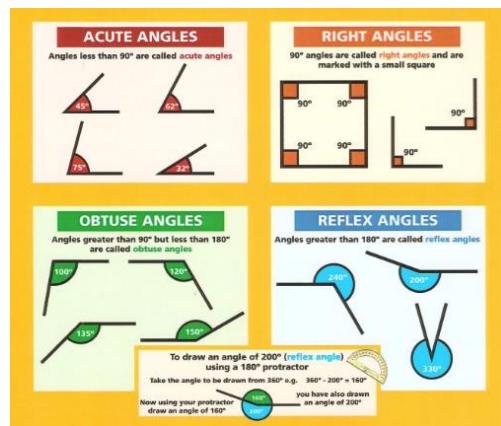
$$\frac{18}{96} = \frac{6}{32} = \frac{3}{16}$$

Divided by 3  
Divided by 2





## Types of angles



## POLYGONS

A POLYGON IS A MANY - SIDED FIGURE

A polygon is called regular when all its sides and angles are equal and irregular when the angles and sides are not all equal.

**INTERIOR ANGLE SUM**

3 SIDES, 1 TRIANGLE, 180°	4 SIDES, 2 TRIANGLES, 360°	5 SIDES, 3 TRIANGLES, 540°

6 SIDES, 4 TRIANGLES, 720°	7 SIDES, 5 TRIANGLES, 900°

NOTICE THE PATTERN, there are always 2 fewer triangles than sides.

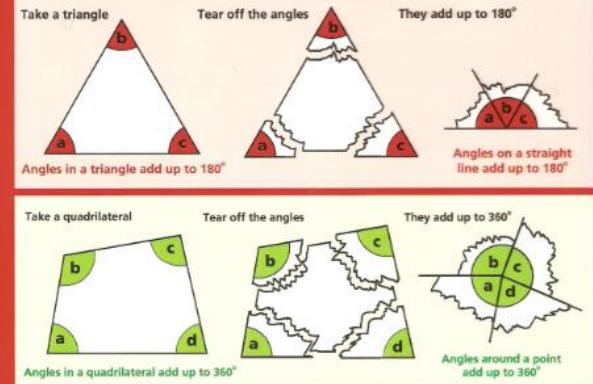
**EXTERIOR ANGLE SUM**

The exterior angles of ANY POLYGON add up to 360°

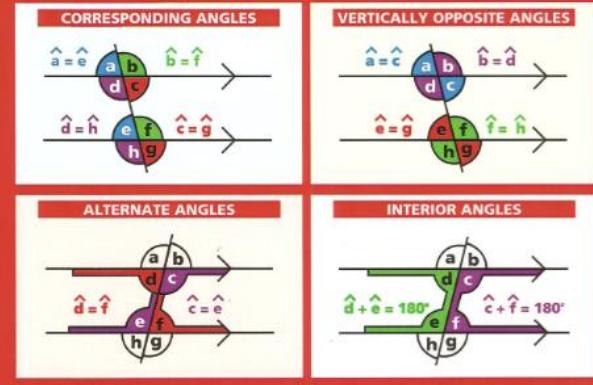
6 SIDES 6 ANGLES	Interior angle + exterior angle = 180° (Angles on a straight line)

In a REGULAR POLYGON each exterior angle =  $\frac{360^\circ}{\text{No. of angles}}$

## ANGLE PROPERTIES



## ANGLE PROPERTIES OF PARALLEL LINES



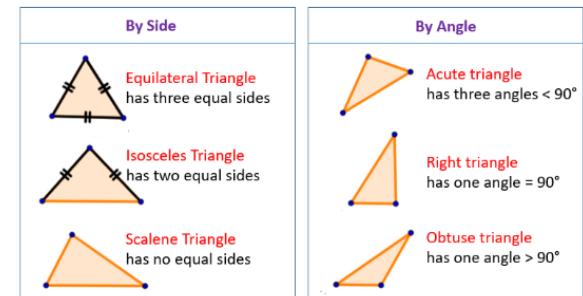
## Names of Polygons



## Properties of Quadrilaterals

Shape name	Drawing	Properties
Square		<ul style="list-style-type: none"> <li>Four equal sides</li> <li>Four right angles</li> <li>Opposite sides parallel</li> <li>Diagonals bisect each other at right angles</li> <li>Four lines of symmetry</li> <li>Rotational symmetry of order four</li> </ul>
Rectangle		<ul style="list-style-type: none"> <li>Two pairs of equal sides</li> <li>Four right angles</li> <li>Opposite sides parallel</li> <li>Diagonals bisect each other</li> <li>Two lines of symmetry</li> <li>Rotational symmetry of order two</li> </ul>
Rhombus		<ul style="list-style-type: none"> <li>Four equal sides</li> <li>Two pairs of equal angles</li> <li>Opposite sides parallel</li> <li>Diagonals bisect each other at right angles</li> <li>Two lines of symmetry</li> <li>Rotational symmetry of order two</li> </ul>
Parallelogram		<ul style="list-style-type: none"> <li>Two pairs of equal sides</li> <li>Two pairs of equal angles</li> <li>Opposite sides parallel</li> <li>Diagonals bisect each other</li> <li>No lines of symmetry</li> <li>Rotational symmetry of order two</li> </ul>
Kite		<ul style="list-style-type: none"> <li>Two pairs of adjacent sides of equal length</li> <li>One pair of equal angles</li> <li>Diagonals intersect at right angles</li> <li>One line of symmetry</li> </ul>
Arrowhead		<ul style="list-style-type: none"> <li>Two pairs of adjacent sides of equal length</li> <li>One pair of equal angles</li> <li>Diagonals intersect at right angles outside the shape</li> <li>One line of symmetry</li> </ul>
Trapezium		<ul style="list-style-type: none"> <li>One pair of parallel sides</li> <li>Isosceles quadrilaterals of this kind have one line of symmetry.</li> </ul>

## Types of Triangles



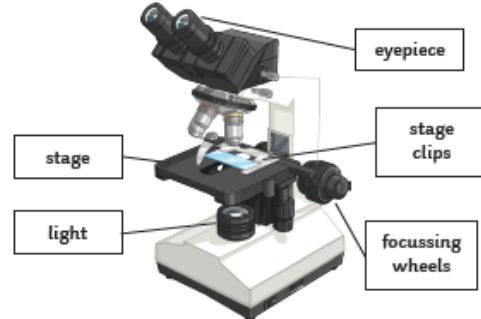
# Science - Cells

## Cell Biology Knowledge Organiser – Foundation and Higher

### Required Practical

#### Microscopy Required Practical

- Includes preparing a slide, using a light microscope, drawing any observations – use a pencil and label important observations.



#### Osmosis and Potato Practical

- Independent variable – concentration.
- Dependent variable – change in mass.
- Control variable – volume of solution, temperature, time, surface area of the potato.

The potato in the sugar solution will lose water and so will have less mass at the end; the potato in the pure water solution will gain water.



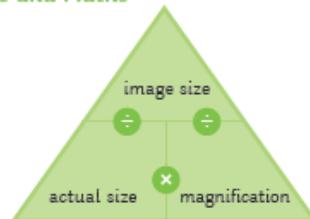
### Specialised Cells

When a cell changes to become a specialised cell, it is called differentiation.

Specialised Cell	Function	Adaptation
sperm	To get the male DNA to the female DNA.	Streamlined head, long tail, lots of mitochondria to provide energy.
nerve	To send electrical impulses around the body.	Long to cover more distance. Has branched connections to connect in a network.
muscle	To contract quickly.	Long and contain lots of mitochondria for energy.
root hair	To absorb water from the soil.	A large surface area to absorb more water.
phloem	Transports substances around the plant.	Pores to allow cell sap to flow. Cells are long and joined end-to-end.
xylem	Transports water through the plant.	Hollow in the centre. Tubes are joined end-to-end.

### Equations and Maths

#### Equation



#### Maths Skills

##### Conversions:

Micrometres to millimetres: divide by 1000.

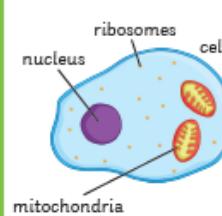
##### Standard Form:

$0.003 = 3 \times 10^{-3}$

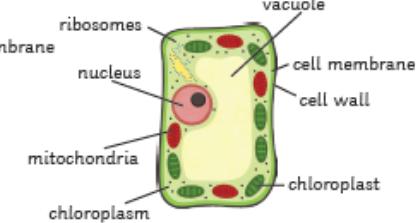
$5.6 \times 10^{-5} = 0.0056$

### Prokaryotic and Eukaryotic Cells

#### Animal Cells



#### Plant Cells

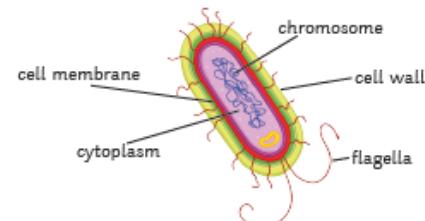


Plant and animal cells have similarities and differences:

	Animal	Plant
nucleus	✓	✓
cytoplasm	✓	✓
chloroplast	X	✓
cell membrane	✓	✓
permanent vacuole	X	✓
mitochondria	✓	✓
ribosomes	✓	✓
cell wall	X	✓

### Bacterial Cells

Bacterial cells do not have a true nucleus, they just have a single strand of DNA that floats in the cytoplasm. They contain a plasmid.





# Science - Cells

## Cell Biology Knowledge Organiser - Foundation and Higher

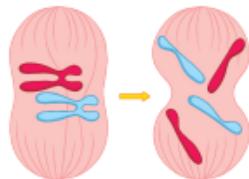
### Chromosomes and Mitosis

In the nucleus of a human cell there are 23 pairs of **chromosomes**. Chromosomes contain a double helix of DNA. Chromosomes have a large number of genes.



The cell cycle makes new cells.

Mitosis: DNA has to be copied/replicated before the cell carries out mitosis.



### Key Vocabulary

active transport

alveoli

chromosome

diffusion

eukaryotic

gas exchange

mitosis

multicellular

osmosis

prokaryotic

undifferentiated

replicated

specialised

villi

### Stem Cells

**Embryonic stem cells** are undifferentiated cells, they have the potential to turn into any kind of cell.



**Adult stem cells** are found in the bone marrow, they can only turn into some types of cells e.g. blood cells.

#### Uses of stem cells:

- Replacing faulty blood cells;
- making insulin producing cells;
- making nerve cells.

Some people are against stem cell research.

For Stem Cell Research	Against Stem Cell Research
Curing patients with stem cells - more important than the rights of embryos.	Embryos are human life.
They are just using unwanted embryos from fertility clinics, which would normally be destroyed.	Scientists should find other sources of stem cells.

### Stem Cells in Plants

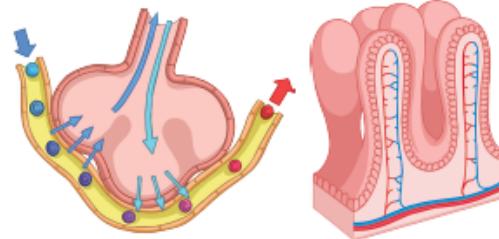
In plants, stem cells are found in the **meristem**. These stem cells are able to produce clones of the plant. They can be used to grow crops with specific features for a farmer, e.g. disease resistant.

### Exchange – Humans

Multicellular organisms have a large surface area to volume ratio so that all the substances can be exchanged.

#### Gas exchange: Lungs

The alveoli are where gas exchange takes place. They have a large surface area, moist lining, thin walls and a good blood supply.

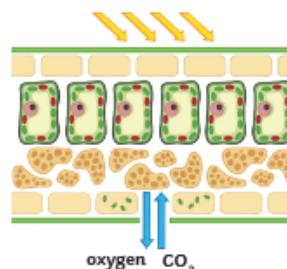


#### Villi: Small Intestine

Millions of villi line the small intestine increasing the surface area to absorb more digested food.

They are a single layer of cells with a good blood supply.

### Exchange in Plants



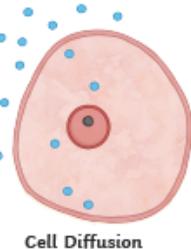
The surface of the leaf is flattened to increase the surface area for more gas exchange by diffusion.

Oxygen and water vapour diffuse out of the stomata. Guard cells open and close the stomata, controlling water loss.

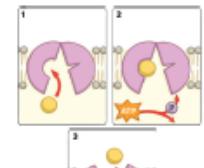
### Key Processes

**Diffusion** is the spreading out of particles from an area of higher concentration to an area of lower concentration.

**Cell membranes** are semi-permeable, only small molecules can get through.



**Osmosis** is the movement of water molecules across a partially permeable membrane from a region of higher concentration to a region of lower concentration.

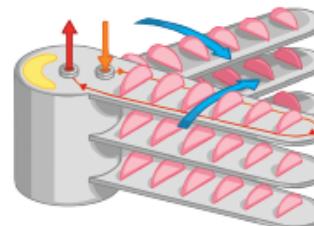


**Active transport** is the movement of substances against the concentration gradient. This process requires energy from respiration.

#### Active Transport in Cells

### Exchange in Fish

Fish have a large surface area for gas exchange. These are called gills. Water enters the fish through the mouth and goes out through the gills. The oxygen is transported from the water to the blood by diffusion. Carbon dioxide diffuses from the blood to the water. Each gill has gill filaments which give the gills a large surface area. Lamellae cover each gill filament to further increase the surface area for more gas exchange. They have a thin surface layer and capillaries for good blood supply which helps with diffusion.





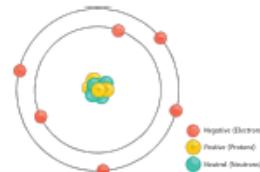
# Science – Periodic Table

## Atomic Structure and the Periodic Table – Foundation and Higher (Separate)

### Atoms

Contained in the nucleus are the protons and neutrons. Moving around the nucleus are the electron shells. They are negatively charged.

Particle	Relative Mass	Charge
proton	1	+1
neutron	1	0
electron	Very small	-1



Overall, atoms have no charge; they have the same number of protons as electrons. An ion is a charged particle - it does not have an equal number of protons to electrons.

### Atomic Number and Mass Number



### Elements

Elements are made of atoms with the same atomic number. Atoms can be represented as symbols.

N = nitrogen    F = fluorine    Zn = zinc    Ca = calcium

**Isotopes** – an isotope is an element with the same number of protons but a different number of neutrons. They have the same atomic number, but different mass number.

Isotope	Protons	Electrons	Neutrons
<sup>1</sup> H	1	1	$1 - 1 = 0$
<sup>2</sup> H	1	1	$2 - 1 = 1$
<sup>3</sup> H	1	1	$3 - 1 = 2$

**Compounds** – a compound is when two or more elements are chemically joined. Examples of compounds are carbon dioxide and magnesium oxide. Some examples of formulas are  $\text{CO}_2$ ,  $\text{NaCl}$ ,  $\text{HCl}$ ,  $\text{H}_2\text{O}$ ,  $\text{Na}_2\text{SO}_4$ . They are held together by chemical bonds and are difficult to separate.

### Equations and Maths

To calculate the relative atomic mass, use the following equation:

$$\text{relative atomic mass (A)}_r =$$

$$\frac{\text{sum of (isotope abundance} \times \text{isotope mass number})}{\text{sum of abundances of all isotopes}}$$

### Balancing Symbol Equations

There must be the same number of atoms on both sides of the equation:



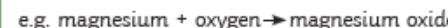
$$\text{C} = 1$$

$$\text{O} = 4$$

$$\text{H} = 4$$

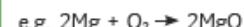
### Chemical Equations

A chemical reaction can be shown by using a word equation.



On the left-hand side are the reactants, and the right-hand side are the products.

They can also be shown by a symbol equation.



Equations need to be balanced, so the same number of atoms are on each side. To do this, numbers are put in front of the compounds.

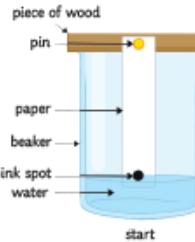


### Mixtures, Chromatography and Separation

**Mixtures** – in a mixture there are no chemical bonds, so the elements are easy to separate.

Examples of mixtures are air and salt water.

**Chromatography** – to separate out mixtures.



**Filtration** – to separate solids from liquids.



**Evaporation** – to separate a soluble salt from a solution; a quick way of separating out the salt.



**Crystallisation** – to separate a soluble salt from a solution; a slower method of separating out salt.



### Separating out salt from rock salt:

1. Grind the mixture of rock salt.
2. Add water and stir.
3. Filter the mixture, leaving the sand in the filter paper
4. Evaporate the water from the salt, leaving the crystals.



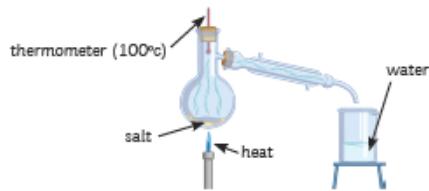
# Science – Periodic Table

## Atomic Structure and the Periodic Table – Foundation and Higher (Separate)

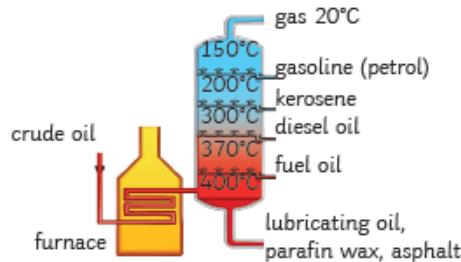
### Distillation

To separate out mixtures of liquids.

1. Simple distillation – separating a liquid from a solution.



2. Fractional distillation – separating out a mixture of liquids. Fractional distillation can be used to separate out crude oil into fractions.



### Metals and Non-metals

They are found at the left part of the periodic table. Non-metals are at the right of the table.

#### Metals

Are strong, malleable, good conductors of electricity and heat. They bond metallically.

#### Non-Metals

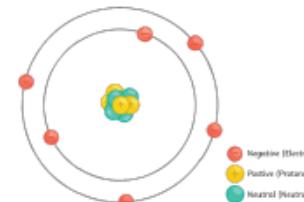
Are dull, brittle, and not always solids at room temperature.

### History of the Atom

Scientist	Time	Discovery
John Dalton	start of 19 <sup>th</sup> century	Atoms were first described as solid spheres.
JJ Thomson	1897	Plum pudding model – the atom is a ball of charge with electrons scattered.
Ernest Rutherford	1909	Alpha scattering experiment – mass concentrated at the centre; the nucleus is charged. Most of the mass is in the nucleus. Most atoms are empty space.
Niels Bohr	around 1911	Electrons are in shells orbiting the nucleus.
James Chadwick	around 1940	Discovered that there are neutrons in the nucleus.

### Electronic Structure

Electrons are found in shells. A maximum of two in the most inner shell, then eight in the 2<sup>nd</sup> and 3<sup>rd</sup> shell. The inner shell is filled first, then the 2<sup>nd</sup> then the 3<sup>rd</sup> shell.



### Group 7 Elements and Noble Gases

#### Halogens

The halogens are non-metals: fluorine, chlorine, bromine, iodine. As you go down the group they become less reactive. It is harder to gain an extra electron because its outer shell is further away from the nucleus. The melting and boiling points also become higher.

#### Noble Gases

The noble gases (group 0 elements) include: helium, neon and argon. They are un-reactive as they have full outer shells, which makes them very stable. They are all colourless gases at room temperature.

The boiling points all increase as they go down the group – they have greater intermolecular forces because of the increase in the number of electrons.

### Development of the Periodic Table

In the early 1800s, elements were arranged by atomic mass. The periodic table was not complete because some of the elements had not been found. Some elements were put in the wrong group.

Dimitri Mendeleev (1869) left gaps in the periodic table. He put them in order of atomic mass. The gaps show that he believed there was some undiscovered elements. He was right! Once found, they fitted in the pattern.

### The Modern Periodic Table

Elements are in order of atomic mass/proton number. It shows where the metals and non-metals are. Metals are on the left and non-metals on the right. The columns show the groups. The group number shows the number of electrons in the outer shell. The rows are periods – each period shows another full shell of electrons.

The periodic table can be used to predict the reactivity of elements.



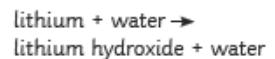
### Alkali Metals

The alkali metals (group 1 elements) are soft, very reactive metals. They all have one electron in their outer shell, making them very reactive. They are low density. As you go down the group, they become more reactive. They get bigger and it is easier to lose an electron that is further away from the nucleus.

They form ionic compounds with non-metals.

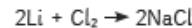
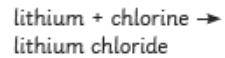
The react with water and produce hydrogen.

E.g.



They react with chlorine and produce salt.

E.g.



They react with oxygen to form metal oxides.



# Science – Energy

## AQA Physics (Combined Science) Unit 6.1: Energy

### Required Practical

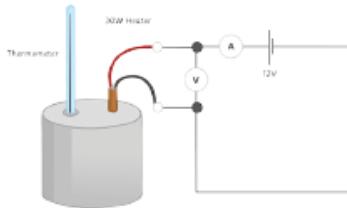
#### Investigating Specific Heat Capacity

independent variable – material

dependent variable – specific heat capacity

control variables – insulating layer, initial temperature, time taken

$$\Delta E = m \times c \times \Delta \theta$$



#### Method:

1. Using the balance, measure and record the mass of the copper block in kg.
2. Wrap the insulation around the block.
3. Put the heater into the large hole in the block and the block onto the heatproof mat.
4. Connect the power pack and ammeter in series and the voltmeter across the power pack.
5. Using the pipette, put a drop of water into the small hole.
6. Put the thermometer into the small hole and measure the temperature.
7. Switch the power pack to 12V and turn it on.
8. Read and record the voltmeter and ammeter readings – during the experiment, they shouldn't change.
9. Turn on the stop clock and record the temperature every minute for 10 minutes.
10. Record the results in the table.
11. Calculate work done and plot a line graph of work done against temperature.

### Equations

$$E = \frac{1}{2}mv^2$$

$$E_p = mgh$$

$$E_e = \frac{1}{2}ke^2$$

$$\Delta E = m \times c \times \Delta \theta$$

$$P = \frac{E}{t}$$

$$P = \frac{W}{t}$$

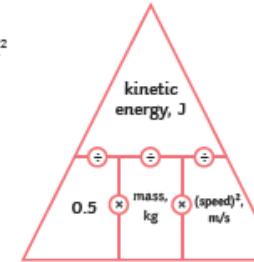
### Kinetic and Potential Energy Stores

#### Movement Energy

$$\text{kinetic energy} = \frac{1}{2} \times \text{mass} \times \text{speed}^2$$

$$E_k = \frac{1}{2}mv^2$$

(J) (kg)(m/s)

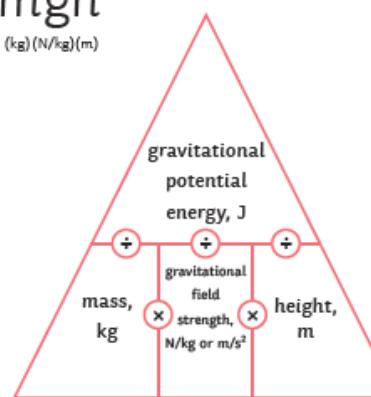


When something is off the ground, it has gravitational potential energy

$$\text{gravitational potential energy} = \text{mass} \times \text{gravitational field strength} \times \text{height}$$

$$E_p = mgh$$

(J) (kg)(N/kg)(m)



When an object falls, it loses gravitational potential energy and gains kinetic energy.

Stretching an object will give it elastic potential energy.

$$\text{elastic potential energy} = \frac{1}{2} \times \text{spring constant} \times \text{extension}^2$$

$$E_e = \frac{1}{2}ke^2$$

(J) (N)(m)

#### Transferring Energy by Heating

Heating a material transfers the energy to its thermal energy store - the temperature increases.

E.g. a kettle: energy is transferred to the thermal energy store of the kettle. Energy is then transferred by heating to the water's thermal energy store. The temperature of the water will then increase.

Some materials need more energy to increase their temperature than others.

$$\text{change in thermal energy} = \text{mass} \times \text{specific heat capacity} \times \text{temperature change}$$

$$\Delta E = m \times c \times \Delta \theta$$

(J) (kg) (J/kg°C) (°C)

Specific heat capacity is the amount of energy needed to raise the temperature of 1kg of a material by 1°C.

# Science – Energy

## Energy Stores and Systems

Energy Stores	
kinetic	Moving objects have kinetic energy.
thermal	All objects have thermal energy.
chemical	Anything that can release energy during a chemical reaction.
elastic potential	Things that are stretched.
gravitational potential	Anything that is raised.
electrostatic	Charges that attract or repel.
magnetic	Magnets that attract or repel.
nuclear	The nucleus of an atom releases energy.

Energy can be transferred in the following ways:

mechanically – when work is done;

electrically – when moving charge does work;

heating – when energy is transferred from a hotter object to a colder object.

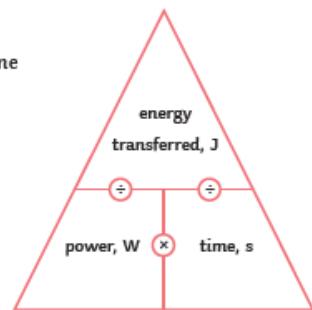
## Conservation of Energy

Energy can never be created or destroyed, just transferred from one form to another. Some energy is transferred usefully and some energy gets transferred into the environment. This is mostly wasted energy.

## Power

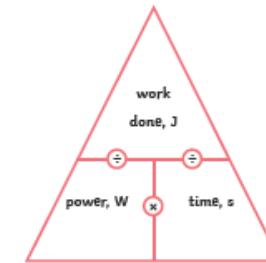
Power is the rate of transfer of energy – the amount of work done in a given time.

power = energy transferred ÷ time



power = work done ÷ time

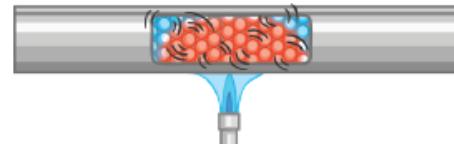
$P (W) = W (J) \div t (s)$



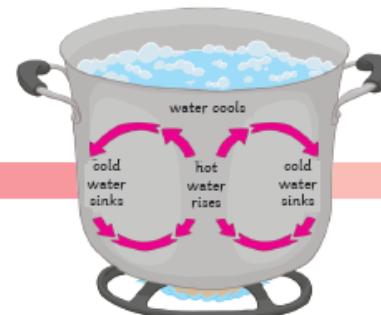
## Energy Transfer

Lubrication reduces the amount of friction. When an object moves, there are frictional forces acting. Some energy is lost into the environment. Lubricants, such as oil, can be used to reduce the friction between the surfaces.

Conduction – when a solid is heated, the particles vibrate and collide more, and the energy is transferred.



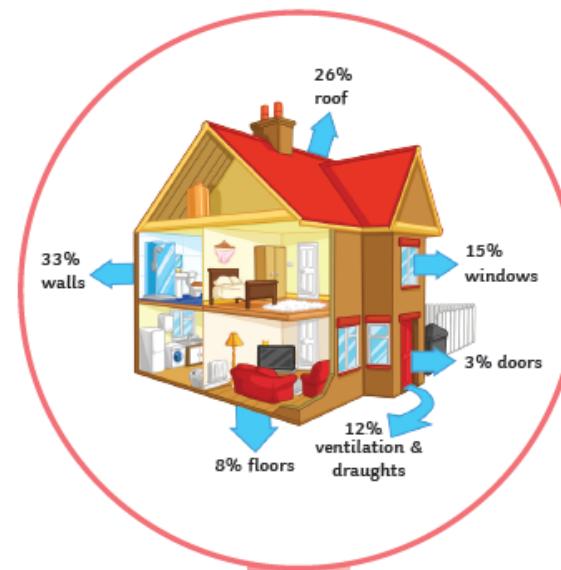
Convection – when a liquid or a gas is heated, the particles move faster. This means the liquid or gas becomes less dense. The denser region will rise above the cooler region. This is a convection current.



## AQA Physics (Combined Science) Unit 6.1: Energy

Insulation – reduces the amount of heat lost. In your home, you can prevent heat loss in a number of ways:

- thick walls;
- thermal insulation, such as:
- loft insulation (reducing convection);
- cavity walls (reduces conduction and convection);
- double glazing (reduces conduction).





# Science – Energy

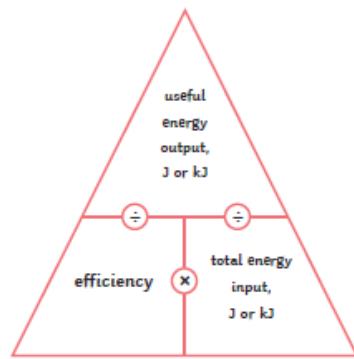
AQA Physics (Combined Science) Unit 6.1: Energy

## Efficiency

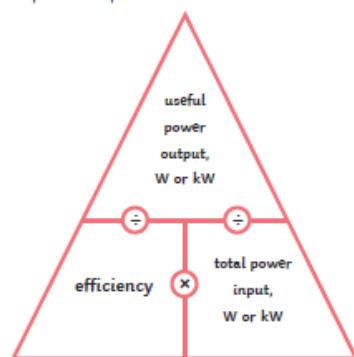
When energy is transferred, some energy is wasted. The less energy that is wasted during the transfer, the more efficient the transfer.

There are two equations to calculate efficiency:

$$\text{efficiency} = \frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$$



$$\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}}$$



Some energy is always wasted. Nothing is 100% efficient.

## Efficiency

Non-renewable – coal, oil, gas - they will all run out, they damage the environment, but provide most of the energy.

Renewable – they will never run out, can be unreliable and do not provide as much energy.

Energy Resource	Advantages	Disadvantages
solar – using sunlight	Renewable, no pollution, in sunny countries it is very reliable.	Lots of energy needed to build, only works during the day, cannot increase power if needed.
geothermal – using the energy of hot rocks	Renewable and reliable as the rocks are always hot. Power stations have a small impact on environment.	May release some greenhouse gases and only found in specific places.
wind – using turbines	Renewable, no pollution, no lasting damage to the environment, minimal running cost.	Not as reliable, do not work when there is no wind, cannot increase supply if needed.
hydroelectric – uses a dam	Renewable, no pollution, can increase supply if needed.	A big impact on the environment. Animals and plants may lose their habitats.
wave power – wave powered turbines	Renewable, no pollution.	Disturbs the seabed and habitats of animals. Unreliable.
tidal barrages – big dams across rivers	Renewable, very reliable, no pollution.	Changes the habitats of wildlife, fish can be killed in the turbines.
biofuels	Renewable, reliable, carbon neutral.	High costs, growing biofuels may cause a problem with regards to space, clearance of natural forests.
non-renewable – fossil fuels	Reliable, enough to meet current demand, can produce more energy when there is more demand.	Running out, release CO <sub>2</sub> , leading to global warming, and also release SO <sub>2</sub> which causes acid rain.

Trends in energy resources – most of our electricity is generated by burning fossil fuels and nuclear. The UK is trying to increase the amount of renewable energy resources. The governments are aware that non-renewable energy resources are running out; targets of renewable resources have been set. Electric and hybrid cars are also now on the market.

However, changing the fuels we use and building renewable power plants cost money. Many people are against the building of the plants near them and do not want to pay the extra in their energy bills. Hybrid and electric cars are also quite expensive.



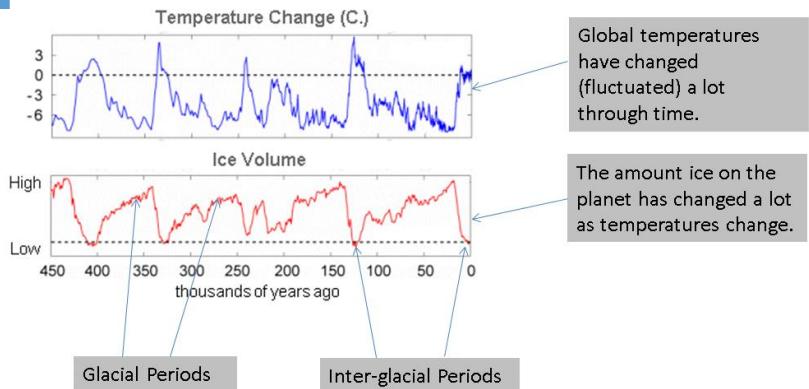
## Geography: Climate Change



### What is Climate Change?

Climate change is a large-scale, long-term shift in the planet's weather patterns or average temperatures. Earth has had tropical climates and ice ages many times in its 4.5 billion years.

Diagrams showing temperature change and ice volume change over hundreds of thousands of years, highlighting the differences between glacial and inter-glacial periods:



Keyword(s)	Definition
<b>Temperature</b>	The degree of heat present in a substance or object, especially as expressed according to a comparative scale and shown by a thermometer.
<b>Average</b>	A number expressing the central or typical value in a set of data.
<b>Global Warming</b>	The long term rise in average global temperatures.
<b>Glacial Periods</b>	A period in the earth's history where it was very cold and there were large volumes of ice on the earth's surface.
<b>Inter-glacial Periods</b>	A period in earth's history where it was warmer and the volume of ice on the earth's surface was much lower.
<b>Greenhouse Gas Emissions</b>	The release of greenhouse gases into the atmosphere, including carbon dioxide, methane and nitrous oxide.
<b>Natural Greenhouse Effect</b>	<b>Greenhouse gases (including CO<sub>2</sub>, methane and nitrous oxide)</b> are a group of compounds that are able to trap heat in the atmosphere, keeping the Earth's surface warmer than it would be if they were not present. Without greenhouse gases, the average temperature of Earth's surface would be about -18 °C, rather than the present average of 15 °C.
<b>Enhanced Greenhouse Effect</b>	Where more and more greenhouse gases are released into the atmosphere due to human activity, leading to global warming.
<b>Methane</b>	A colourless, odourless flammable gas which is the main constituent of natural gas.

### Natural Causes of Climate Change:

<b>Changes in Earth's Orbit: Milankovitch Cycles</b>	Milankovitch proposed 3 cycles that affect Earth's climate: (1) <b>Eccentricity</b> - The Earth's orbit is an ellipse. The Sun is not perfectly in the middle of the ellipse and the ellipse changes shape every 100 000 years. This means that the distance between the Earth and the Sun changes as it orbits. As the Earth orbits closer to the sun, the climate becomes warmer, and the opposite happens as it orbits away from the sun. (2) <b>Axial Tilt</b> - The Earth's axis is tilted at an angle. The angle of the tilt changes due to the gravitational pull of the moon. When the angle of the tilt increases, this can exaggerate the climate, so summers get warmer and winters get colder. The angle of the tilt moves back and forth every 41 000 years. (3) <b>Precession</b> : The Earth is not a perfect sphere, so as the Earth spins, it wobbles on its axis in 20 000 year cycles.
<b>Solar Output (Sun Spots)</b>	The output of the Sun is measured by observing sunspots on the Sun's surface. When sunspot activity is at a maximum, the Sun gives off more heat. When sunspot activity is at a minimum the solar output is reduced. This can lead to either higher or lower temperatures on Earth.
<b>Volcanic Eruptions</b>	Volcanic eruptions can have both a cooling and warming effect on the planet. When a volcano erupts it releases large amounts of dust containing gases. These can block sunlight and result in cooler temperatures. However, volcanoes release CO <sub>2</sub> , which can intensify global warming leading to warmer temperatures.
<b>Continental Drift</b>	All of the continents are still moving. In the geological past, the UK and the rest of Europe was nearer the Equator and the UK had a desert climate (hot and dry). It has also had different climate types. If continents are in different positions on the planet, the amount of heat energy reflected or absorbed by the earth changes. This means the climate will change. Continental drift could also lead to a change in ocean currents. Ocean currents move heat around the planet and changing them can lead to changes in climate.

## Geography: Climate Change

### Human Causes of Climate Change:

<b>Use of Fossil Fuels</b>	Fossil fuels (coal, gas, oil) account for the majority of global greenhouse gas emissions – over 50%. Burning them releases carbon dioxide into the atmosphere. Fossil fuels are used in transportation, building, heating homes, and the manufacturing industry.
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<b>Agriculture (Farming)</b>	Agriculture contributes to approx. 20% of greenhouse gas emissions, mainly through the production and release of methane.
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<b>Deforestation (Cutting down trees)</b>	During photosynthesis, trees absorb CO <sub>2</sub> , which reduces the amount of CO <sub>2</sub> in the atmosphere. Deforestation leaves fewer trees to absorb CO <sub>2</sub> .
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### Recent Evidence for Human Caused Climate Change:

<b>Global temperature increase</b>	Average global temperatures have steadily increased by more than 0.6°C since 1950.
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<b>Melting ice sheets and glaciers</b>	Many of the world's glaciers and ice sheets are melting. e.g. Arctic sea ice has decreased by 10% in 30 years.
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<b>Sea level change</b>	Average global sea levels have risen by 10-20cms in the past 100 years. This is due to the additional water from ice and thermal expansion.
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### Consequences of Climate Change for the U.K:

<b>Change in Patterns of Rainfall</b>	Levels of summer rainfall have fallen since pre-industrial times, while winter rainfall has increased. These trends are expected to continue – meaning drier summers and wetter winters. This may lead to water shortages in the summer and flooding in the winter months.
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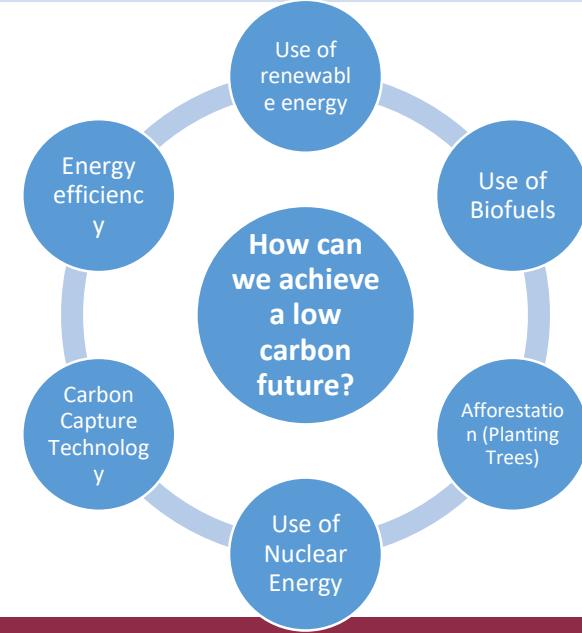
<b>Hotter Weather</b>	The effects would be largest in the UK's southern areas and smallest in northern areas. Hot summers and heat waves would be more common and cold winters rarer.
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<b>Rising Sea Levels</b>	Areas that have been identified as particularly vulnerable to coastal flood risk include South Wales, north-west Scotland, Yorkshire, Lincolnshire and East Anglia.
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<b>Issues for the NHS</b>	Increased temperatures may result in more illness and death from heat related conditions.
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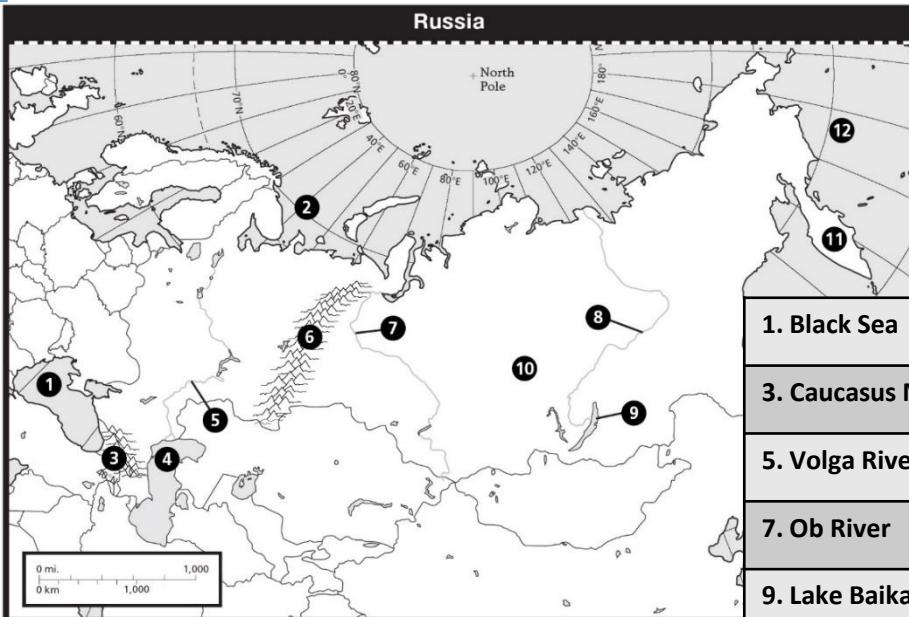
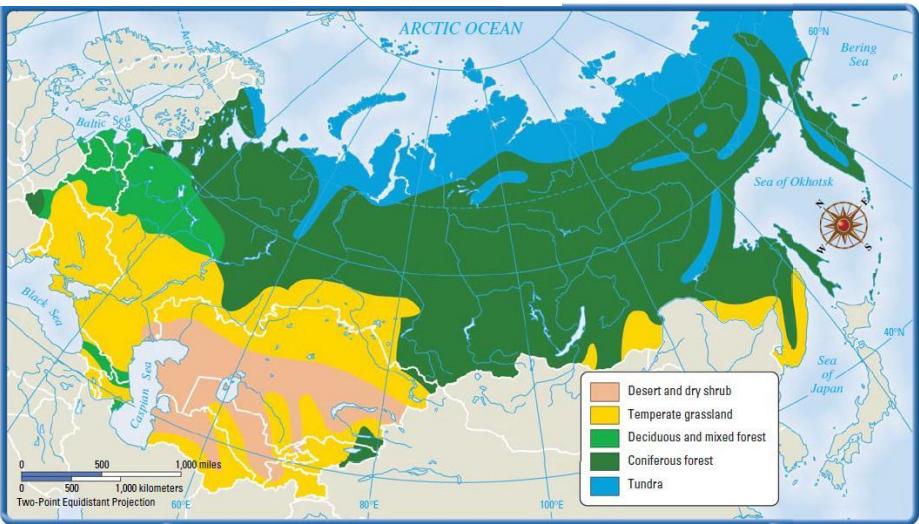
<b>Threats to Wildlife</b>	There are warnings that rising temperatures will disrupt UK wildlife. Large storms will damage habitats and as different species' behaviour changes, the balance between predators and their prey will be affected.
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Keyword(s)	Definition
<b>Flooding</b>	The covering or submerging of normally dry land with a large amount of water.
<b>Afforestation</b>	The planting of trees over a large area.
<b>Biofuels</b>	Fuels produced from living matter e.g. from plants or animal waste.
<b>Renewables</b>	A natural resource or source of energy that is not depleted by use, such as water, wind, or solar power.
<b>Nuclear Energy</b>	The energy released during nuclear fission or fusion, especially when used to generate electricity.
<b>Carbon Capture</b>	The process of trapping <b>carbon dioxide</b> at its emission source, transporting it to a usually underground storage location, and isolating it there.
<b>Energy Efficiency</b>	A way of managing and limiting growth in energy consumption, to save wildlife habitats, safeguard the planet, and make sure there is energy left for future generations.



# Geography: Russia

## Biomes of Russia:



Map highlighting important Physical Features of Russia.

Keyword(s)	Definition
<b>Map Scale</b>	The scale of a map is the ratio of a distance on the map to the corresponding distance on the ground e.g. 1 cm on a map may equal 1 km on the ground.
<b>Vast</b>	Of very great area or extent/of very great size or proportion.
<b>Asian</b>	Relating to the continent of Asia, its people, customs or languages.
<b>European</b>	Relating to the continent of Europe, its people, customs or languages.
<b>Tundra</b>	A vast, flat, treeless Arctic region of Europe, Asia, and North America in which the subsoil is permanently frozen.
<b>Taiga</b>	A type of forest located in the Earth's far northern regions, consisting mainly of cone-bearing evergreens, such as firs, pines, and spruces, and some deciduous trees, such as larches, birches, and aspens. The taiga is found just south of the tundra.
<b>Temperate</b>	A region or climate characterized by mild temperatures.
<b>Desert</b>	A desert is a barren area of landscape where little precipitation occurs and, consequently, living conditions are hostile for plant and animal life.
<b>Sub-Arctic</b>	Relating to the region immediately south of the Arctic Circle.
<b>Mountain Climate</b>	Mountain climate, also known as highland climate is a geographical term that refers to the kind of climate in the mountains.
<b>Desert Climate</b>	A climate typified by extremely low levels of rainfall, extreme heat in the day and cold at night.

1. Black Sea	2. Barents Sea
3. Caucasus Mountains	4. Caspian Sea
5. Volga River	6. Ural Mountains
7. Ob River	8. Lena River
9. Lake Baikal	10. Central Siberia Plateau
11. Kamchatka Peninsula	12. Bering Sea

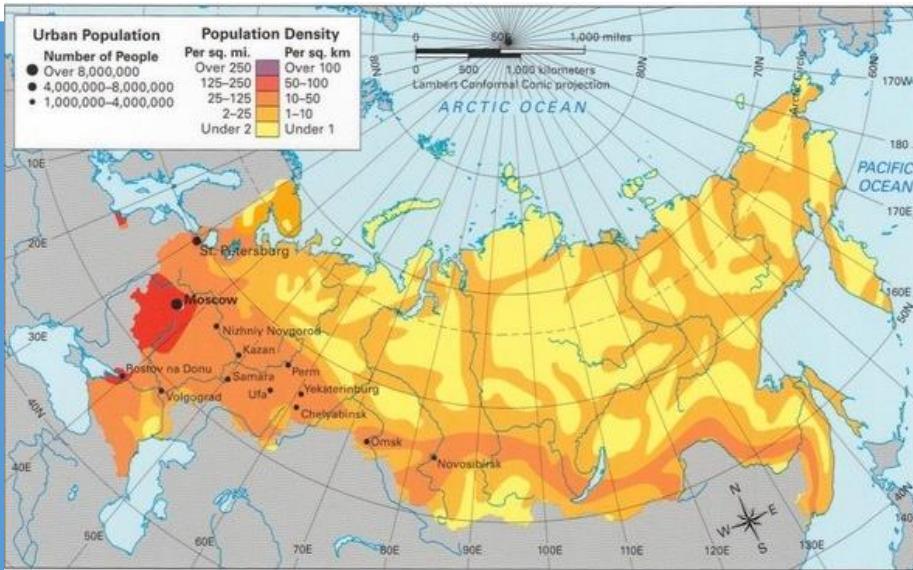
As the world's largest country by land size, Russia occupies **one-tenth of all the land on Earth**. It spans 11 time zones across two continents (Europe and Asia) and has shores on three oceans (the Atlantic, Pacific and Arctic Ocean).

Because much of the land is uninhabitable, Russia has a sparse population for its enormous land size, with 140 million inhabitants.

The Russian landscape varies from sandy and frozen deserts, tall mountains to giant marshes.

# Geography: Russia

**Chloropleth Map showing population density of Russia:**



The map above shows that the majority of Russia's population lives in the south west of the country. The primary reason for this is because the climate is warmer in comparison with the central and eastern parts of the country.

## Reasons Tourists Visit Russia:

Impressive Religious Sites and Architecture

Russian Literary History

Art and Museums

Untouched Nature and Beautiful Landscapes

A Strong Tradition of Music and Dance e.g. Russian Ballet.

The Winter Olympics City of Sochi – one of the only places in the world to host both a ski resort and a seaside resort in the same location.

To visit the capital city of Moscow and second city of St Petersburg

**The tourist industry contributes billions of US\$ per year to the Russian economy.**



St Petersburg, Russia.

Keyword(s)	Definition
<b>Population Density</b>	The number of people living in an area. It is worked out by dividing the number of people in an area by the size of the area.
<b>Chloropleth Map</b>	A thematic map in which areas are shaded or patterned in proportion to the measurement of the data being displayed on the map, such as population density, shown to the left.
<b>Urban Population</b>	The total population living in areas termed as urban (towns/cities).
<b>Rural</b>	Relating to, or characteristic of the countryside.
<b>Urban</b>	Relating to, or characteristic of a town or city.
<b>Push Factor</b>	Push Factors are negative things that make people want to move to a new area e.g. war.
<b>Pull Factor</b>	Pull Factors are positive aspects that attract people to move to a place e.g. good employment opportunities.
<b>Chernobyl Nuclear Disaster (1986)</b>	Caused by a nuclear accident that occurred in April 1986, at the No. 4 reactor in the Chernobyl Nuclear Power Plant. It is considered one of the worst nuclear disasters in history.
<b>Nuclear Energy</b>	The energy released during nuclear fission or fusion, especially when used to generate electricity.
<b>Meltdown</b>	A severe nuclear reactor accident that results from overheating.
<b>Nuclear Fallout</b>	The radiation that affects a particular place or area after a nuclear explosion has taken place.
<b>Tourism</b>	Travel for recreational, leisure, or business purposes.
<b>Cultural Tourism</b>	Visiting a place because of the history of those people, their art, architecture, religion(s), and other elements that helped shape their way of life.
<b>Tourism Income</b>	Money generated by tourism.
<b>Tourist Resorts</b>	A specific place where people travel to for relaxation or recreation e.g. a ski resort or a seaside resort.
<b>Imports</b>	The process of purchasing goods or services from overseas and bringing them into another country.
<b>Exports</b>	Refers to a country selling products and services to other countries around the world.
<b>Reliance</b>	Dependence on someone or something else.

## History - Women & The Vote

### Women's rights 1800s & early 1900s

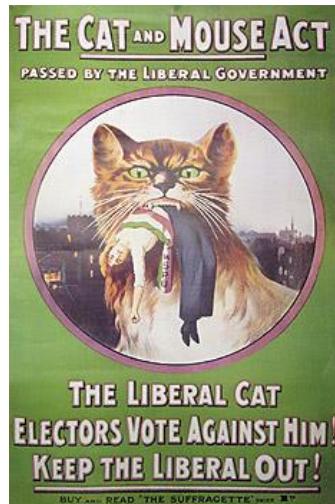
Women had no political rights, they could not vote, most jobs were closed to them & they had no control over their money once they married. The majority of lower class women were employed in menial jobs such as domestic servants or in the clothing trade. Women received less education than men.

### Suffragists (National Union of Women's Suffrage Societies)

- Formed in 1897 by Millicent Fawcett
- Used peaceful methods as they thought they would have more chance of achieving their aims through sensible methods
- Encouraged men to join
- Trained women to speak at public meetings, produced pamphlets and supported candidates in elections who were in favour of women's suffrage.
- BUT some people felt it would take too long to win the campaign using these methods

### Suffragettes (Women's Social & Political Union)

- Formed in 1903 by Emmeline Pankhurst & her daughters Christabel & Sylvia
- Their motto was 'deeds not words'. They were prepared to used violence to achieve their aims.
- This included throwing stones, breaking windows & bombing empty buildings. Many suffragettes went on hunger strike once they were in prison.



Key Terms	Definitions
<b>Suffrage</b>	The right to vote in elections
<b>Domestic servants</b>	Servants who worked in peoples homes such as maids or cooks
<b>Suffragists</b>	Campaigned for votes for women using peaceful methods
<b>Suffragettes</b>	Campaigned for the vote using violent methods
<b>Cat &amp; Mouse Act</b>	A law introduced to release starving suffragettes from prison & then return them later
<b>Hunger strike</b>	Refusing to eat. Many suffragettes were force fed as a result.
<b>Martyr</b>	Someone who dies for their beliefs

### The Cat & Mouse Act (1913)

Many suffragettes went on hunger strike during their time in prison. The government was forced to release them to stop them from dying.

The Cat & Mouse Act allowed the government to release suffragettes from prison until their health had recovered. They were then returned to prison when their health had recovered.

### Emily Davison

Dedicated suffragette, who went to prison a number of times for violent protests (throwing stones & setting fire to letter boxes). Derby Day 1913 - ran in front of the King's horse and died shortly after. Did she mean to kill herself?

**Yes** - she had tried to kill herself in prison before, so the suffragettes had a martyr  
Her crimes were becoming more extreme

**No** - she didn't write a goodbye letter to her mother, so her friends thought she didn't mean to die  
She wanted to pin a suffragette flag to the king's horse to embarrass him & gain publicity

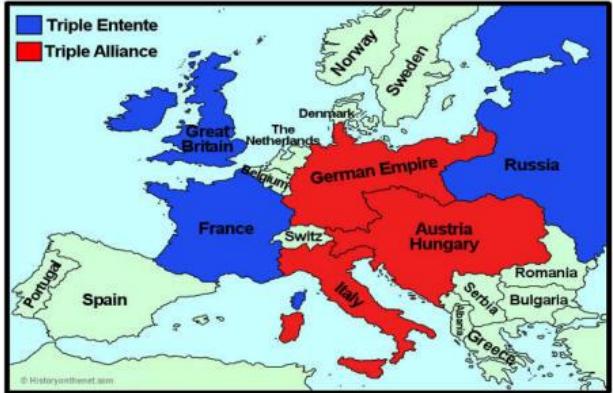
## History The Causes Of World War 1

### The Great Powers

5 largest countries in Europe - Great Britain, France, Germany, Austria-Hungary & Italy.

All had increased their spending on their militaries (armies & navies). Britain was the largest and most powerful country, but Germany wanted to overtake her. Britain resented this.

### World War One Alliances 1914



The Great Powers split into two alliances:

- The Triple Entente
- The Triple Alliance

The aim was to provide protection and support if attacked.

It could also prevent war as neither alliance was stronger.

### Long term causes of the war

**Militarism:** Britain & Germany started a race to build the biggest fleet of Dreadnoughts. This increased tension further.

**Imperialism:** Britain had the largest empire in the world. Germany had a smaller empire, but wanted to become the dominate power.

**Nationalism:** Russia wanted a bigger empire. It was the enemy of Austria-Hungary (A-H) and wanted to help the countries in the Austro-Hungarian Empire to become independent.

**Nationalism:** Most of Serbia's population was made up of **slavs**.

Serbia wanted to unite all the slav people in the A-H Empire.

Russia wanted to help Serbia achieve its aim.

**Nationalism:** In 1871 Germany took Alsace-Lorraine from French control. The French wanted revenge

**Alliances:** In 1839 Britain signed an agreement with Belgium. She promised to help if Belgium was attacked by Germany.

Key Terms	Definitions
Alliances	An agreement or partnership between countries
Empire	A group of countries ruled by another
Nationalist	Someone who believes in nationalism
Self-determination	The right of people to have the freedom to run their own country
Triple Alliance	Germany, Italy & Austria-Hungary
Triple Entente	Britain, France & Russia
Militarism	preparing for war building up your armed forces
Nationalism	believing that your country is the best and wanting to make it strong
Nationalist	Someone who believes in nationalism
Imperialism	wanting to have a large empire to rule over
Alliances	two or more countries agree to help each other
Slavs	An eastern-European ethnic group



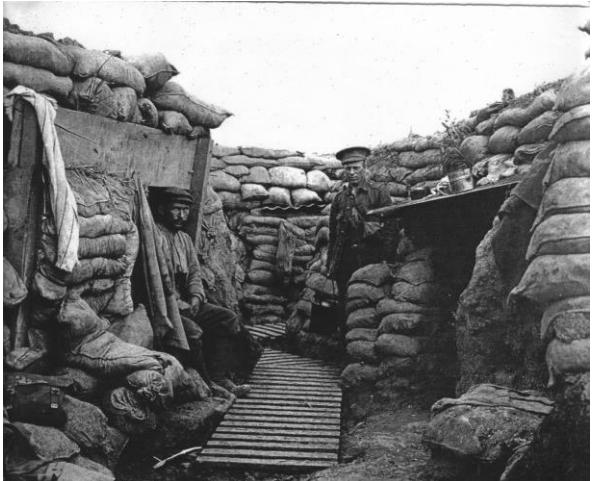
### Short term/trigger cause of the war

- 28<sup>th</sup> June 1914 Archduke Franz Ferdinand was assassinated in Sarajevo by Gavrilo Princip, a member of the **Black Hand**.
- Princip wanted the Slavs in the A-H empire to be freed, so a Slav nation under the leadership of Serbia could be established.
- Germany offered to support A-H if they declared war on Serbia.
- Russia had an alliance with Serbia.
- A-H declared war on Serbia and the alliances were triggered.

## History - World War 1: Trenches & Weapons

### Recruitment

Britain asked men to volunteer to join up. 'Pals Battalions' were formed to make volunteering more appealing but by 1916 it was clear that the Derby Scheme had failed and not enough men were being recruited. In January 1916 the government passed the first Military Service Act. All single men aged 18-41 could be called up. A second act in May 1916 extended the scheme to married men in the same age group.



Both sides 'dug in' and the war became a stalemate. Conditions in the trenches were very poor e.g. dangerous, open to the weather & could be attacked at any time. Men suffered from shell-shock, flooding, rats, injuries & boredom.

### Weapons & new technology

Zeppelins	German airships which could fly far enough to bomb Britain. Bombed Britain between 1915 & 1917 when the British developed tactics to shoot them down
Aeroplanes	Used first for reconnaissance, later for bombing. Pilots fought each other in the air & the most successful became known as 'aces'.

Key Terms	Definitions
Pals Battalions	Men from the same town or area were put together in the same army units
Derby Scheme	Men promised they would join up if asked to
Military Service Act	Introduced conscription (where men were forced to join up)
Stalemate	Neither side can win
Shell shock	A psychological illness which was caused by the stress and trauma of fighting. Now known as PTSD.
Duck boards	Boards placed at the bottom of the trench
Trench foot	Caused by wet conditions. It caused flesh to rot
Reconnaissance	Observing the enemy

Tanks	Invented by the British and used first at the Battle of the Somme in 1916. Although they surprised the Germans, they were unreliable and many broke down.
Gas	The French used tear-gas against the Germans in Sept 1914 but it was the Germans who used chlorine gas first in Oct 1915. Different types of gas caused different injuries; chlorine damaged the lungs & phosgene killed its victim in 48 hours.
The war at sea	Neither side wanted to risk their huge fleets, so there was only one battle at Jutland in 1916. There was no overall winner.

## History - World War 1: Civilians and medicine

### Medical care

New treatments were developed throughout the war

**Shellshock:** not recognised as an illness at first, officers were treated more sympathetically than ordinary soldiers. Rest was the only treatment.

**Blood loss:** ways of storing blood for longer for transfusions developed.

**Gas gangrene:** doctors would cut out infected flesh and treat with a saline solution.

**Wounds:** plastic surgery was developed to treat men with severe facial wounds

Key Terms	Definitions
Rationing	Restricting the amount of food people have access to
DORA	Defence of the Realm Act, gave the government powers to control Britain during the war
Munitions	Weapons and ammunition
VADS	Voluntary Aid Detachments, women who volunteered to work in hospitals
WAAC	Women's Army Auxiliary Corps, not allowed to fight but filled support roles such as cooks & drivers. Naval version WRNS.

Area	British civilians	German civilians
Bombing	First bombed by ship, Dec 1914, 127 people killed. Zeppelins started attacking in 1915, mainly attacked towns in south east & London. Later attacks by plane, deaths: 1,413, injured: 3,409.	German mainland bombed from 1918 , casualties: 740, injured: 1,900.
Rationing	Food shortages caused by German attacks on ships. April 1917, only 6 weeks of wheat supplies left. Jan 1918 the government introduced rationing for sugar, meat, butter, cheese and margarine.	By 1918 food was short due to the British blockade that people were surviving on bread & turnips. Medicine and clothing was also running out.
Government control	Defence of the Realm Act (DORA) introduced Aug 1914. Brought in a range of restrictions e.g. talk about naval or military matters in public places, fly a kite & censor newspapers.	

**Women** - needed to replace the men who had joined up, women paid less than men in similar jobs.

### Munition factories

Very dangerous: explosions & health problems.

June 1917: 80% of all munitions made by women

### Nursing

Some women set up their own hospitals. Some nurses lived in poor conditions near to fighting.

### Armed forces

Women took over jobs in army, navy & air force to free up men to fight.

### Home Front

Women took over jobs in areas such as the police, ship building & coal mining. They also had to run their homes & families without their husbands.

# **Religious Education - Vocation, Cohesion and the Multi Ethnic Society**

## Key Terms

Talent: Something somebody is good at

**Laity:** Members of the religious congregation who are not part of the clergy (priests etc.)

Ordination: The ceremony by which somebody from the laity becomes clergy

**Multi-Ethnic:** A society which contains people from many different ethnic (and usually religious) origins

**Discrimination:** Treating somebody less favourably because of a characteristic they possess

**Gang:** A group of people who form around common interests but who have leaders and followers based upon imbalances of power and sometimes fear

**Power:** The influence one person has over another

**Radicalisation:** Where people are taught to think in a certain way on political or social issues

**Far Right:** A belief that the government should use its powers to only support the dominant ethnic group within a country or area (often believing that other races/groups should be criminalised/removed)



## Religious Education - Vocation, Cohesion and Multi Ethnic Society

### Key Questions

#### What is a vocation?

- Vocation is about having a sense of duty
- Using your skills to the benefit of other people
- Could be related to a job or a role in society
- Examples of jobs: Teacher; nurse; counsellor
- Examples of roles in society: Parent; sister; friend

#### What does vocation mean to Christians? Why is it important to them?

- Christians believe that God gives them talents and it is their duty to use them to benefit others
- The parable of the Gold Coins/Parable of the Talents: Rich man gives three servants 10 gold coins each. The first two invest the money and come back with even more. The third servant buries the money and returns with the same amount. The third servant is described as 'cruel and wicked' because he does not make 'more money'. The gold coins symbolise talents! If you use them, you'll get more.

#### How do people commit themselves to religious life/vocation?

- To become a priest, the sacraments of holy orders must be taken. This means different things in the different denominations – e.g. a Catholic priest becomes 'married' to the church and should avoid sexual relationships.
- Monks and nuns may take holy orders and live in monasteries/convents. If they are apostolic, they work closely with and within wider communities, if contemplative, they live a life of prayer and worship separate to the general public

#### Should women play a more important role in the Christian church?

- In some denominations – they already do! The Church of England has had women priests since 1994 and now has women bishops
- Some of the most important people in the Bible (e.g. Mary, mother of Jesus) are women – so women have very important roles to play, but can't be priests in some denominations (e.g. Roman Catholic)
- Many people now believe in equality
- The Bible teaches: "There is neither Jew nor Greek, there is neither slave nor free, there is no male and female, for you are all one in Christ Jesus" Galatians 3: 28

#### What is a multi-ethnic society? Do we have one in the UK?

- People of different races, religions and ethnic groups living together in harmony
- We are encouraged to live in multi-faith society in Britain
- More successful in some areas than others
- Many rural areas continue to be much more 'white British'
- Many urban areas are segregated whereby people of certain races and cultures concentrate in certain areas and schools etc, whereas those of other races and cultures live elsewhere
- There is protection in law. It is illegal to discriminate against somebody on the grounds of race/religion etc.
- Consciously or unconsciously, prejudice does still happen

#### What is racism and discrimination? What does the Bible tell Christians about it?

- Discrimination means treating somebody less favourably because of their race, religion, gender etc.
- The Bible teaches people to value and care for those around them to whom they are not related: "You shall love your neighbour as yourself." There is no other commandment greater than these." (Mark 12: 31)
- The Parable of the Good Samaritan teaches Christians to not treat others less favourably because they are different to them.

#### Does community cohesion exist in the UK?

- To some extent
- Better in some areas than others
- Segregation has occurred in some places

#### Does gang violence pose a threat in the UK?

- Yes, to some people
- Young people more likely to be drawn into gang activities
- Involves the imbalance of power. A young person may be tricked into accepting gifts, but the giver may expect something back in return
- Can be tied to violence

#### What is radicalisation and why is it dangerous?

- Some people have 'extreme' views which are very different to what is accepted as 'normal'
- Where they use violence or intimidation to promote their views, they become extremists.
- When extremists try to convince others to take on those views (they use various tactics to do this) then they become radicals. This is dangerous and in many cases illegal



Burqa

Niqab

Hijab



## Religious Education – Moral Issues in RE

### Key Terms

**Just War Theory:** An internationally agreed criteria which, if followed, makes war lawful. Follows traditional Christian rules for war.

**Lawful:** Allowed by law (could be the law of a country or international law)

**Appropriate force:** The minimum amount of force required to achieve the intended aim

**Falklands Islands:** Chain of islands off East coast of South America. A British overseas territory which was invaded by Argentina in 1982 (and subsequently taken back in the Falklands War)

**Nuclear Weapons:** Weapons which work by nuclear reaction, devastate huge areas and can kill large numbers of people

**Weapons of Mass Destruction:** Weapons which can potentially kill large numbers of people and/or cause a lot of damage

**Chemical Weapons:** Weapons which use chemicals to poison, burn or paralyse humans and destroy the natural environment

**Biological Weapons:** Weapons that have living organisms or infected material that can lead to disease or death

**Terrorism:** The unlawful use of violence, usually against civilians, to achieve a political goal

**Protest:** An expression of disapproval, often in a public group

**Violent Protest:** Using violence (for example causing an injury to others) in order to express disapproval

**Retribution:** An aim of punishment – to ‘get your own back’ on somebody for something they did to you

**Deterrence:** An aim of punishment – to put people off committing a crime

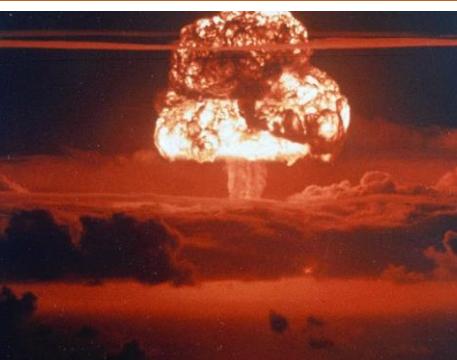
**Reformation:** An aim of punishment – to change somebody’s behaviour for the better

**Prison:** A place where somebody is held as a form of punishment

**Corporal Punishment:** Punishment of an offender by causing them physical pain (illegal in the UK, legal in some countries such as Indonesia and Singapore)

**Capital Punishment:** The death penalty – the punishment whereby a person is put to death because of the crimes they have committed (illegal in the UK and EU although not in some states of the USA)

**Community Service:** A way of punishing offenders by making them do unpaid work in the community (sometimes called ‘community payback’ in the UK)



## Religious Education – The Old Testament

### Key Questions

#### Can war be justified?

- Sometimes it may be the only option, e.g. Self defence defending somebody else etc.
- Should follow the *Just War Theory* –
  - It should have a reasonable cause
  - declared by a government
  - should be to defeat wrongdoing
  - should be the last resort (all other options other than fighting must have been tried)
  - use reasonable force
  - there must be a chance of success

#### What do Christians think about nuclear weapons/weapons of mass destruction?

- Most think that nuclear weapons violate the sanctity of life (life is special, only God should take it away)
- Chemical weapons also cause mass casualties, and so Christian groups are against them
- Some see military personal as legitimate targets, but civilians are defenceless and so it would be wrong to kill them
- One of the ten commandments is : “Thou shalt not murder”
- Some think they can be used in defence: “Eye for an eye”

#### Can religious terrorism ever be justified?

- Many religious groups are oppressed
- In countries where there is freedom of speech and a right to protest, there are other options
- Terrorism involves fear and usually the death of innocent people – it cannot be justified!
- Air India Flight 182 bombed over the Atlantic in 1985 by Canadian Sikh extremists in revenge for the Indian Government’s murder of Sikhs at the Golden Temple in Amritsar. This bombing was terrorism and could not be justified as innocent people died and fear was created

#### Why do people commit crimes?

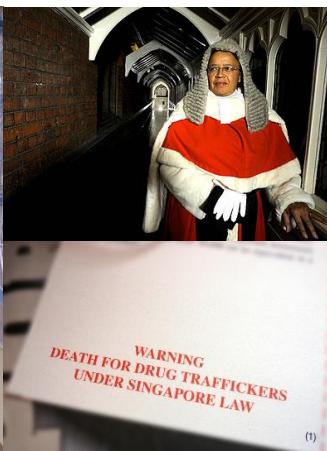
- There are many reasons why people commit crimes:
  - Poverty
  - Upbringing
  - Mental illness
  - Addiction
  - Greed
  - Hate
  - Opposition to an unjust law

#### What are the Christian attitudes towards the treatment of criminals?

- There are many different attitudes towards criminals, often they depend on whether the Christian takes a literal (what is written is fact) or liberal (what is written should be interpreted by the individual) view of the Bible
- Christians condemn many crimes, but generally believe that criminals can be rehabilitated (made better)
- Christians often work in prisons to help with the rehabilitation of offenders
- Many Christians believe in equality so feel prisoners should be treated fairly

#### Do Christians believe in the death penalty?

- A very difficult topic
- Some US states which are ‘very Christian’ have the highest proportion of executions in the world
- It states in the Bible that revenge can be taken for wrongdoing: “An eye for an eye, tooth for tooth...” (Exodus 21: 24) – some take this literally, that murderers should themselves be executed. Other Christians say that it should be a punishment *as bad as...*



## Year 9 French Term 1: Ma vie et ma santé (My life & my health)

French	Literal ('dodgy') English
<b>Décris toi-même.</b>	<b>A</b> <b>Describe yourself.</b>
À mon avis, je suis plutôt drôle et assez intelligente. Cependant, il faut que je dise que	1 In my opinion, I am rather funny and quite intelligent. 2 However, I must say that
je suis un peu lunatique et je ne suis pas patiente non plus.	3 I am a bit moody and I am not patient either.
Je dirais que je rassemble à mon père car	4 I would say that I resemble to my father because
on a tous les deux <b>les cheveux bruns</b> et <b>les yeux verts</b> .	5 we have both the hairs brown and the eyes green.
Je ne suis pas du tout comme ma sœur, car je la trouve pénible et timide.	6 I am not at all like my sister 7 because I her find annoying and shy.
<b>Que penses-tu des réseaux sociaux ?</b>	<b>B</b> <b>What think-you of the networks social?</b>
Je dirais que je suis accro aux réseaux sociaux !	8 I would say I am addicted to the networks social!
Je passe des heures sur FB et je l'utilise tous les jours	9 I spend hours on Facebook and I it use all the days.
bien que ce soit une perte de temps.	10 although it is a waste of time.
Je lis mes messages tout le temps et	11 I read my messages all the time and
de temps en temps je partage des photos.	12 from time to time I share some photos.
Il est facile d'organiser des sorties donc	13 It is easy to organise some outings so
je pense que c'est indispensable à la vie sociale.	14 I think that is indispensable (essential) to the life social.
<b>Tu veux y aller ?</b>	<b>C</b> <b>You want there to go?</b>
Je vais au cinéma ce soir. Tu viens avec moi ?	15 I am going to the cinema this evening. You come with me?
Ça t'intéresse ? Tu veux m'accompagner ?	16 It you interests? You want me to accompany?
D'accord, je veux bien / Non, je n'ai pas (trop) envie.	17 OK, I want to / No, I don't (really) feel like it
On se retrouve quand / où ? Chez moi à 19h.	18 We meet when / where? My house at 7pm.
<b>Qu'est-ce que tu as fait samedi soir ?</b>	<b>D</b> <b>What you have done Saturday evening?</b>
Samedi dernier, je suis sortie avec mon copain.	19 Saturday last, I went out with my friend (m)
D'abord on est allés au cinéma et	20 First we went to the cinema et
ensuite on a mangé au restaurant. C'était délicieux !	21 then we ate at the restaurant. It was delicious!
On a bavardé beaucoup et on a bien rigolé.	22 We chatted a lot and we had a good laugh.
J'espére que je vais le voir bientôt.	23 I hope that I am going to see too.
<b>La musique, c'est important pour toi ?</b>	<b>E</b> <b>The music, is it important for you?</b>
J'ai une passion pour la musique, surtout la musique pop.	24 I have a passion for the music, especially the music pop/
Je l'écoute tout le temps sur mon portable.	25 I it listen all the time on my phone.
L'année dernière je suis allée à un festival avec mes amis.	26 Last year I went to a festival with my friends.
On a chanté et on a dansé toute la journée.	27 We sang and we danced all the day.
Il y avait beaucoup de monde. C'était incroyable !	28 There was a lot of people. It was incredible!
L'année prochaine je vais aller à un concert de Louane	29 Next year I am going to go to a concert of Louane
parce que j'adore ses mélodies et ses paroles.	30 because I love her melodies and her lyrics.

Sentence Builder 1 – talking about personality.

VERB PHRASE WITH 'ETRE'	INTENSIFIER	POSITIVE ADJECTIVE	NEGATIVE ADJECTIVE
<b>je pense que je suis</b> (I think that I am)	très (very)	bavardes <b>chatty</b>	agaçantes <b>annoying</b>
<b>je ne suis pas du tout</b> (I am not at all)	trop (too)	compréhensifives <b>understanding</b>	casse-pieds <b>annoying</b>
<b>je dirais que je suis</b> (I would say that I am)	vraiment (really)	drôles <b>funny</b>	débrouillardes <b>resourceful</b>
<b>mes amis disent que je suis</b> (my friends say that I am)	assez (quite)	généreux/ <b>ses</b> generous	égoïstes <b>selfish</b>
<b>il faut que je dise que je suis</b> (I must say that I am)	plutôt rather	gentilles kind	lunatiques <b>moody</b>
<b>tu es</b> (you are)	un peu (a bit)	honnêtes honest	parasseux/ <b>ses</b> lazy
<b>il / elle est</b> (he / she is)	marrantes funny	marrantes funny	pessimistes <b>pessimistic</b>
<b>on est / nous sommes</b> (we are)	optimistes <b>optimistic</b>	optimistes <b>optimistic</b>	pénibles <b>annoying (a pain)</b>
<b>ils / elles sont</b> (they are)	patientes patient	patientes patient	impatientes <b>inpatient</b>
<b>je le / la / les trouve</b> (I find him/her/them)	rigolotes funny	rigolotes funny	têtues <b>stubborn</b>
<b>je voudrais être plus / moins</b> (I would like to be more / less)	sympas nice	timides shy	timides <b>shy</b>
		travailleur/ <b>ses</b> hardworking	

SB 2 – describing a past event using the perfect tense (le passé composé)

PAST TIME PHRASE	SUBJECT + AUXILIARY VERB 'AVOIR'	PAST PARTICIPLE + ACTIVITY
<b>Hier</b> yesterday	j'ai (I have) (you have) (he/she has) (we have)	écouté de la musique bu un coca fait les magasins / une promenade
<b>Samedi soir</b> Saturday night	tu as elle a on a nous avons vous avez ils/elles ont	joué à des jeux vidéos / au foot done shopping / a walk
<b>La semaine dernière</b> last week		lu un livre mangé au restaurant regardé la télé
<b>Le week-end dernier</b> last weekend	je suis allée / on est allées au parc je suis sortie / on est sorties je suis restée / on est restées à la maison	I went / we went to the park / we went out / we went stayed at home
<b>L'année dernière</b> Last year		
		(N.B. these are <b>irregular</b> because they use <b>être</b> as the auxiliary verb)
VERB	INTENSIFIER	ADJECTIVE
<b>C'était</b> it was	assez quite très very plutôt rather un peu a bit vraiment really	amusant fun relaxant relaxing formidable terrific génial great nul rubbish barbant tedious ennuyeux boring affreux terrible

To extend your sentences, link several events using SEQUENCERS:  
d'abord = first of all / puis = then / ensuite = next / après = afterwards

Grammar – 3 tenses

PRESENT	PERFECT PAST TENSE	NEAR FUTURE
<b>je joue</b> (I play)	j'ai joué (I have played)	<b>je vais jouer</b> (I am going to play)
<b>je regarde</b> (I watch)	j'ai regardé (I have watched)	<b>je vais regarder</b> (I am going to watch)
<b>j'écoute</b> (I listen)	j'ai écouté (I have listened)	<b>je vais écouter</b> (I am going to listen)
<b>je mange</b> (I eat)	j'ai mangé (I have eaten/ate)	<b>je vais manger</b> (I am going to eat)
<b>je lis</b> (I read)	j'ai lu (I have read)	<b>je vais lire</b> (I am going to read)
<b>je fais</b> (I do)	j'ai fait (I did/have done)	<b>je vais faire</b> (I am going to do)
<b>je bois</b> (I drink)	j'ai bu (I have drunk)	<b>je vais boire</b> (I am going to drink)
<b>je prends</b> (I take)	j'ai pris (I have taken/took)	<b>je vais prendre</b> (I am going to take)
<b>je vais</b> (I go)	<b>je suis allée</b> (I went)	<b>je vais aller</b> (I am going to go)
<b>je sors</b> (I go out)	<b>je suis sortie</b> (I went out)	<b>je vais sortir</b> (I am going to go out)
<b>je reste</b> (I stay)	<b>je suis restée</b> (I stayed)	<b>je vais rester</b> (I am going to stay)

French	Literal ('dodgy') English	
	A	Are you sporty?
<b>Es-tu sportif/ve ?</b>		
Oui, je dirais que je suis plutôt sportif/ve.	1 Yes, I would say that I am rather sporty.	
Personnellement je préfère les sports individuels	2 Personally I prefer the sports individual,	
mais mes amis adorent jouer en équipe.	3 but my friends love to play in team.	
Je fais de la natation depuis quatre ans et	4 I do swimming since four years and	
je pense que c'est un beau sport	5 I think that it's a beautiful sport	
parce que c'est bon pour le corps et le mental.	6 because it's good for the body and the mind.	
Pour être un bonne sportif/ve il faut	7 To be a good sportsman/woman one must	
bien dormir et être motivé.e.	8 well sleep and be motivated.	
<b>Est-ce que tu manges sain ?</b>	B	Do you eat healthily?
J'essaie de manger sain la plupart de temps.	9 I try to eat healthily the most-part of time.	
Comme casse-croûte, je prends des fruits	10 As snack, I take of fruits	
parce que c'est plein de vitamines,	11 because it's full of vitamins.	
Pour le dîner je mange du poisson, de la viande	12 For dinner I eat of fish, of meat	
et beaucoup des légumes.	13 and lots of vegetables.	
Cependant, hier soir j'ai mangé trop des sucreries.	14 However, last night I ate too much of sweets.	
Bien que ce soit mauvais pour la santé,	15 Although it is bad for the health,	
c'était absolument délicieux !	16 it was absolutely delicious!	
<b>Quelles sont tes résolutions pour l'avenir ?</b>	C	What are your resolutions for the future?
Pour améliorer ma santé à l'avenir	17 To improve my health in the future	
je serai moins parasseux/se et je ferai plus de sport.	18 I will be less lazy and I will do more of sport.	
Je vais faire trente minutes d'exercice par jour.	19 I am going to do thirty minutes of exercise per day.	
Aussi, je mangeraï équilibre	20 Also, I will eat balanced	
et je boirai moins de boissons gazeuses,	21 and I will drink less of drinks fizzy	
parce que c'est mauvais pour les dents.	22 because it's bad for the teeth.	
<b>Es-tu en forme ?</b>	D	Are you in shape?
Moi j'adore jouer à des jeux vidéo.	23 Me, I love to play video games.	
Mon problème, c'est que je ne suis pas très actif/ve.	24 My problem, it's that I am not very active.	
Alors, j'ai pris des résolutions.	25 So, I made some resolutions.	
D'abord je ferai plus de sport et	26 First, I will do more sport and	
ensuite je mangeraï plus des fruits et des légumes.	27 then I will eat more fruit and vegetables.	
Hier je suis allée au collège à pied avec mes amis.	28 Yesterday I went to school by foot with my friends.	
Après on est allée au fast-food,	29 After, we went to the fast-food	
mais j'ai bu de l'eau et je n'ai pas pris des frites !	30 but I drank of water and I didn't take of fries!	

### Sentence builder 3 – talking about sport using frequency phrases & ‘depuis’.

VERB	FREQUENCY	'SINCE'	TIME	CONNECTIVE + REASON
je joue <b>au basket</b>	tous les jours		deux ans	car c'est amusant / rigolo. because it's fun
je joue <b>au foot</b>	tous les soirs	depuis since	two years	car c'est bon pour le corps et le mental. because it's good for the body and the mind
je joue <b>au tennis</b>	tous les soirs			car quand je fais ça, j'oublie mes problèmes. because when I do it, I forget my problems.
je joue <b>à la pétanque</b>	tous les samedis		six mois six months	parce que ça me fait du bien. because it does me good.
je fais <b>de l'équitation</b> (I do horseriding)	tous les samedis		six months	parce que ça diminue le stress. because it reduces stress.
je fais <b>de l'escalade</b> (climbing)	une fois par semaine			parce que ça me détend / fatigue. because it relaxes / tires me.
je fais <b>de la danse</b> (swimming)	une fois par semaine			parce que ça booste le moral. because it boosts your mood.
je fais <b>du vélo</b> (bike riding)	souvent often			
	de temps en temps			
	from time to time			
	rarement			
	rarely			

### SB 4 – talking about food & drink using the partitive article (**du** / **de la** / **des**).

MEAL	VERB	PARTITIVE ARTICLE	FOOD/DRINK	CONNECTIVE	REASON
Pour for le petit-déjeuner breakfast	je mange	du some - m	pain poisson lait	parce que because	c'est bon pour la santé. it's good for your health.
je bois	i drink	de la some - f	viande meat glace ice cream	car because	c'est délicieux. it's delicious.
le déjeuner lunch		des	boissons gazeuses		c'est plein de vitamines. it's full of vitamins.
le dîner dinner	je prends	some - pl	fizzy drinks sucreries sweets produits laitiers dairy products légumes / fruits vegetables / fruits		ça me donne de l'énergie. it gives me energy.
le goûter after school snack					bien que ce soit mauvais pour la santé. although it's bad for your health.
Comme casse-croûte as a snack		de l' some- before vowel	eau water		

### SB 5 – talking about future plans using the near future and the simple future tenses.

#### NEAR FUTURE OR SIMPLE FUTURE

je vais être	je serai	plus saine / sportif/ve	je ne joue pas	I don't play
I am going to be	I will be	more healthy / sporty	je ne joue plus	I no longer play
je vais faire	je ferai	moins parasseux/ <b>se</b> less lazy	je ne joue jamais	I never play
I am going to do	I will do			
je vais jouer	je jouerai	plus de sport more sport	l'épaule shoulder	
I am going to play	I will play	du vélo bikeriding	la bouche mouth	
je vais aller	l'irai	trente minutes d'exercice par jour	la jambe leg	
I am going to go	I will go	thirty minutes of exercise per day	la main hand	
je vais manger	je mangeraï	au collège à pied et pas en bus	la tête head	
I am going to eat	I will eat	to school on foot and not by bus	le bras arm	
je vais boire	je boirai	équilibré a balanced diet	le dos back	
I am going to drink	I will drink	moins de sucreries fewer sweets	le genou knee	
je vais prendre	je prendrai	moins de boissons gazeuses	le pied nose	
I am going to take	I will take	less fizzy drinks	les dents foot	
		les escaliers the stairs	les fesses teeth	
		des cours d'arts martiaux karate classes	les oreilles buttocks	
			les yeux eyes	

# Art

## Colour Theory

**Primary colours** are the three main colours, they can't be made, but are used to mix all of the other colours

**Secondary colours** are made by mixing two primary colours

**Tertiary colours** are made by mixing a primary and a secondary colour

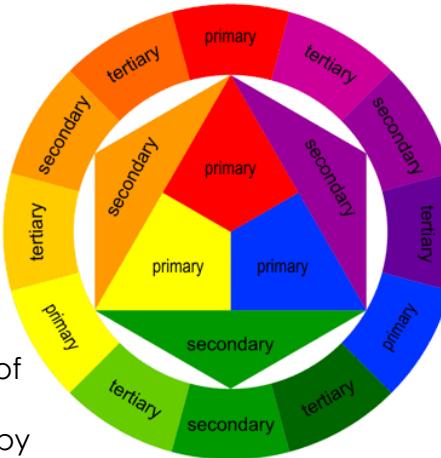
**Harmonious colours** are next to each other on the colour wheel

**Complementary colours** are opposite each other on the colour wheel

**Tint** – when you add white to a colour to make it lighter



**Shade** – when you add black to a colour to make it darker



### Making things look 3D:

To stop drawings looking flat use a range of tone and marks. Pressing harder and light and layering with your pencil creates different tones and adds depth.



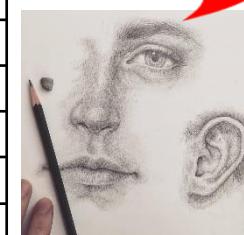
### Technique Keywords

<b>Media/Medium</b>	The materials and tools used by an artist to create a piece of art
<b>Technique</b>	The way an artist uses tools and materials to create a piece of art
<b>Composition</b>	Where you place objects on the page
<b>Highlight</b>	The bright or reflective area on an object or piece of art, this area is closest to the light source
<b>Shadow/Shade</b>	The darker areas within a piece of art or object
<b>Proportion</b>	The size relationship between different parts e.g. height compared to width

## The Formal elements of Art

Tone	How light or dark something is	
Line	A mark which can be long, short, wiggly straight etc...	
Colour	What you see when light reflects off something. Red, blue and yellow are primary colours	
Texture	How something looks or feels e.g. smooth or rough	
Pattern	A symbol or shape that is repeated	
Shape	A 2D area which is enclosed by a line e.g. a triangle	
Form	Something which has 3 dimensions e.g. a cube, sphere or a sculpture	

**Mark Making:** To make drawings look more realistic try to use different marks on the surface. You can do this by changing the direction, pressure or length of your marks. Mark making can be used in conjunction with shading or separately.



## Art - Portraiture

In this project you will be exploring the features of the face, the rules of the face. You will create a successful portrait using a full range of tone and directional shading.

The **Grid method** is a tool used to help you draw whilst keeping everything in proportion. It allows you to break down drawings and concentrate on smaller sections at a time. The more squares the use the more accurate you can be.

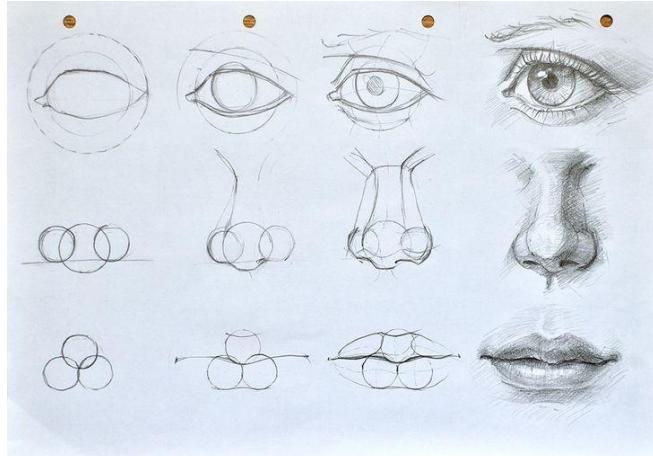


### Grades of pencil

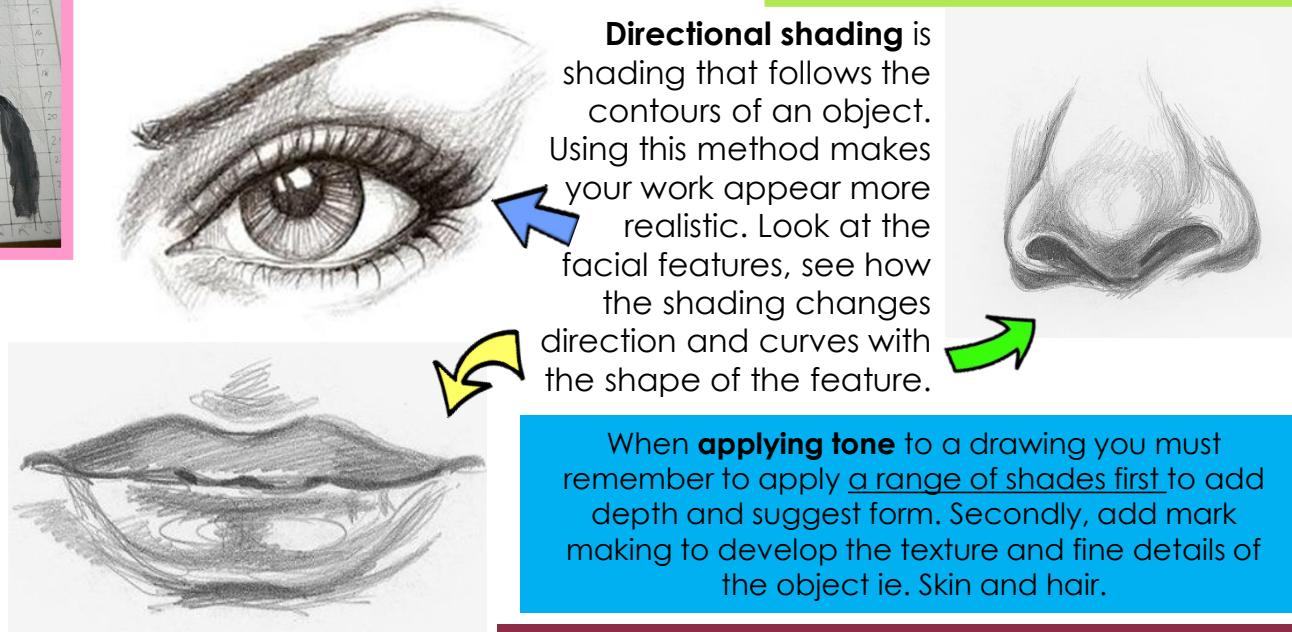
Pencils come in different grades, the softer the pencil, the darker the tone.

H=Hard B=Black

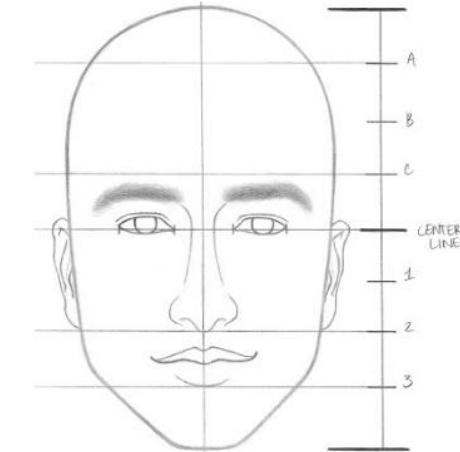
In art the most useful pencils for shading are 2B and 4B. If your pencil has no grade, it is most likely HB(hard black) in the middle of the scale.



**Constructing a drawing** is important to ensure you keep correct proportion. Use simplified shapes to develop the structure of your drawing. Start with the largest structures first. Look at the steps above and have a go at copying them.



When drawing a portrait it is important to remember that facial features are all connected in their position to each other. What relationships can you see on the face below?



**Directional shading** is shading that follows the contours of an object. Using this method makes your work appear more realistic. Look at the facial features, see how the shading changes direction and curves with the shape of the feature.

When **applying tone** to a drawing you must remember to apply a range of shades first to add depth and suggest form. Secondly, add mark making to develop the texture and fine details of the object ie. Skin and hair.

# Pop Art

In this project you will explore the work of many notable Pop Artists that have influenced the face of Modern Art and subsequent Artists.



## PATTERN

IS THE REPETITION OF THE ELEMENTS OF ART OR ANYTHING ELSE.

**PATTERNS OF LINE:**

**PATTERNS OF SHAPE:**

**PATTERNS OF COLOR:**

**NOTICE OTHER PATTERNS IN YOUR LIFE:**  
Breathing, Music, Math, Jumping Jacks, Butterfly Wings, Fabric, Habits . . .

**PATTERN IS EVERYWHERE!**

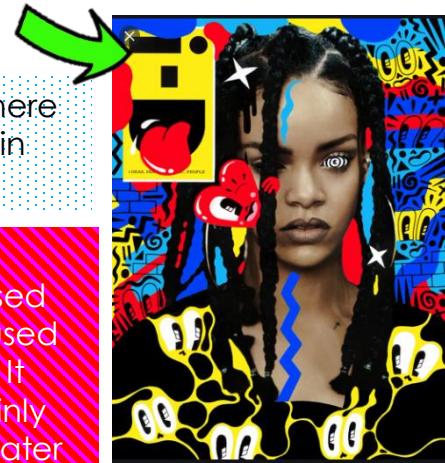
**Pop Art** is an art movement that emerged in the 1950s and flourished in the 1960s in America and Britain, drawing inspiration from sources in popular and commercial culture. Different cultures and countries contributed to the movement during the 1960s and 70s.

**Onomatopoeia** is a word that phonetically imitates, resembles, or suggests the sound that it describes, i.e. 'boom' 'sizzle' 'crack'

**Roy Lichtenstein** was a prominent artist in the Pop Art movement and was responsible for some of the most notable pieces of Pop Art.

**Andy Warhol** was a contemporary of Lichtenstein and created some of the world most recognisable images like the Campbell Soup can and Marilyn Monroe's colourful portrait.

**Hattie Stewart** is a modern British artist influenced by the Pop Artists of the past. A self-titled 'professional doodler'. Her most notable works are art of her 'doodle-bombing' series, an example can be seen below.



## Media

**Acrylic paint** is water-based fast-drying paint widely used by artists since the 1960s. It can be used thickly or thinly depending how much water is added to it.

**Collage** is pasting paper cut-outs onto various surfaces, it can also include other media such like painting and drawing.





**Market Research-** The action or activity of gathering information about consumers' needs and preferences.

**Customer-** What would you customer think of the product? Is it suitable for them? Does it fulfil their needs?

**Aesthetics-** Describe what the object looks like, you can discuss its colour, texture, features and more

**Cost-** Discuss the cost of the product, is it too expensive? too cheap? Would your client be happy with the price? Is it good value for money?

**Environment-** What location will your product be suitable for? Is your product environmentally friendly?



**Size-** What are the dimensions of your product? Is it just right? Too big? Too small?

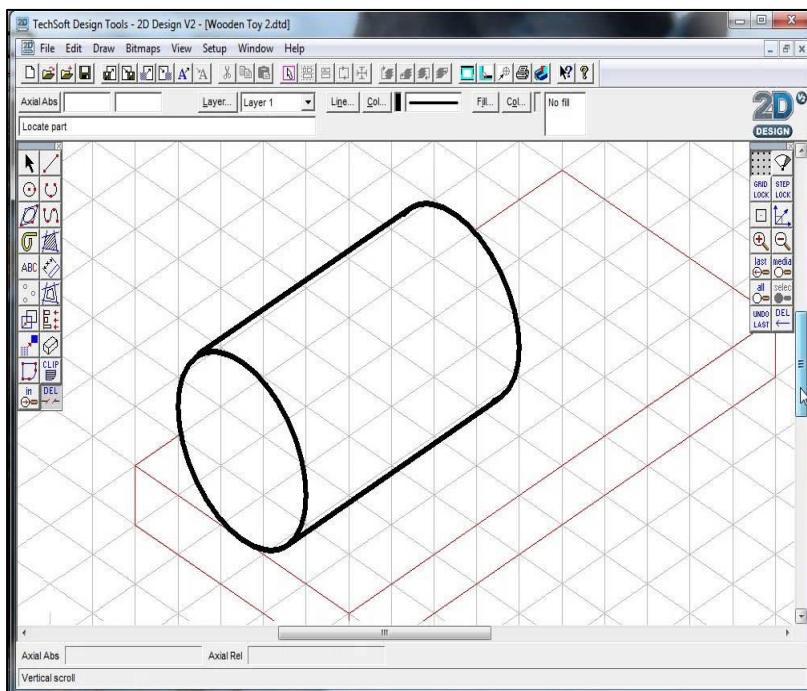
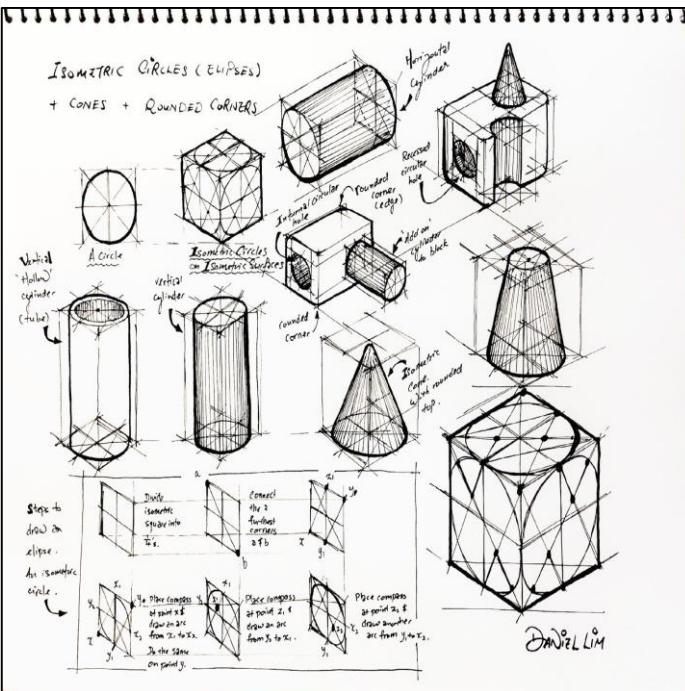
**Shape-** Describe the shape of your product, Is the shape suitable for your client? Could it be improved?

**Materials-** Describe the materials, What is the product made of? Are the materials suitable?

**ACCESSFM-** This is a useful tool used to analyse a product in detail

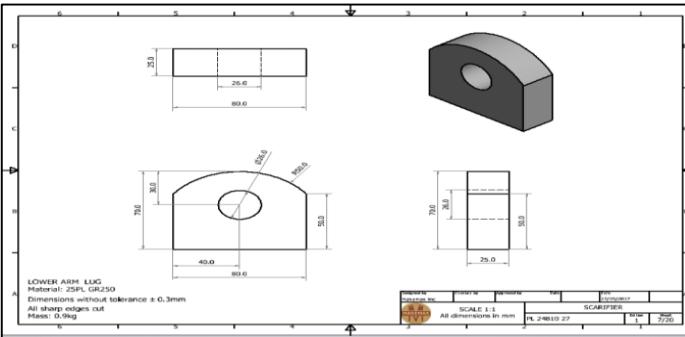
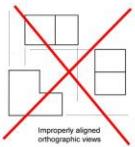
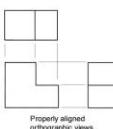
## Design and Technology – Stage Design for Women in Black

**Isometric Drawing-**  
**Isometric projection** is a method for visually representing three-dimensional objects in two dimensions in technical and engineering drawings



### Orthographic Projection

Views are aligned with one another (features project from one view to the next)



**Orthographic projection** is a means of representing three-dimensional objects in two dimensions. It is a form of parallel projection, in which all the projection lines are orthogonal to the projection plane, resulting in every plane of the scene appearing in affine transformation on the viewing surface.

**Prototypes-** In design we make small models of the actual product that is going to be designed using cheaper materials. This allows a potential buyer to visually see and feel what the actual product will look like

### Prototypes-





**Design and Technology – Stage**  
**Design for Women in Black**

**Tolerances**

**Tolerance** is the allowable variation for any given size in order to achieve a proper function

Example: If I ask for a piece of wood to be cut to 500mm long and there is a tolerance of +/- 2mm, it can be 502mm or 498mm long!

This is what is known as a tolerance

TOLERANCING	SCALE	SIZE
00 = $\pm 0.2$		
00.0 = $\pm 0.1$		
00.00 = $\pm 0.05$		
angular = $\pm 0^{\circ}30$		
<b>ALL DIMENSIONS IN MM</b>		
3rd ANGLE PROJECTION		
<b>DO NOT SCALE</b>		

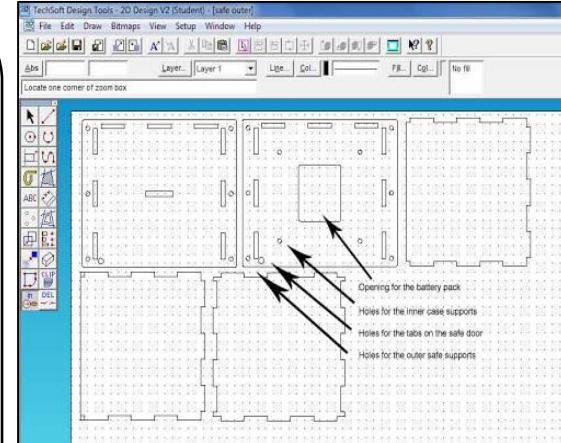
## 2D Design - CAD, CAM and CNC

**CAD Computer-Aided-Design**

**CAM Computer-Aided-Manufacture**

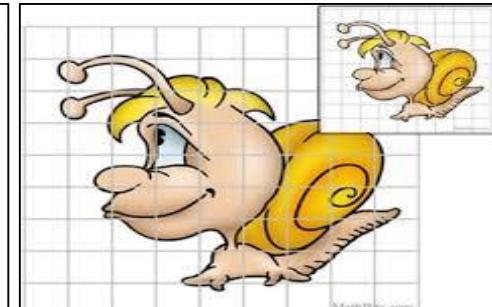
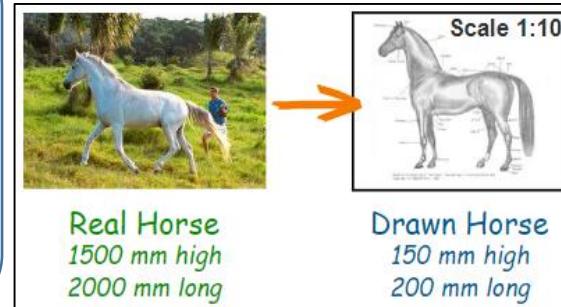
**CNC means Computer-Numerical-Control**

2D Design Software is an example of CAD. (Computer Aided Design) 2d design offers speed, accuracy and the capability of being modified over and over again. CAD software is used by design engineers to produce Engineering drawings to scale



**Scaled Drawings- Why use scaled drawings ?**

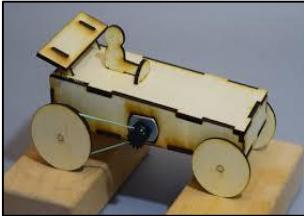
A drawing that shows a real object with accurate sizes reduced or enlarged. We can't design a building as big as the Eiffel tower so we have to draw it smaller. This is called a scaled drawing.



## **Design and Technology– Stage Design for Women in Black**



# 2D Laser Cutter



A **2D** and **3D cutter** is a high powered **laser** that cuts material such as thin metals or woods, used mostly for industrial purposes. They make precise and clean cuts, it is also very fast which makes it efficient. It is first designed through a computer and then sent through a **laser cutter** to give you the design.



**Advertising** - The activity or profession of producing advertisements for commercial products or services.

**Studies show** that people rely on emotions, rather than information, to make brand decisions. Emotional responses to ads influence a person's intent to buy more than the actual ad content.

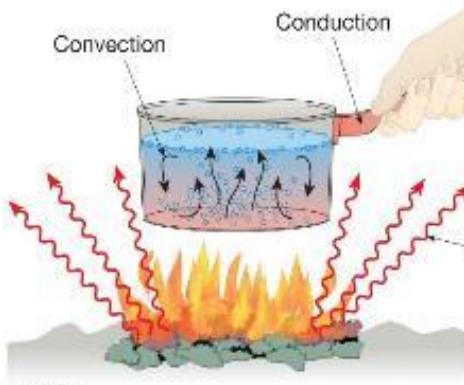
Whether you try to evoke happiness, sadness, fear, or anger, appealing to emotions can help your target audience feel your message — not simply read or hear it.

Catchy songs like "Nationwide is on your side" is an example of helping people associate friendliness with the Nationwide brand. Coca-Cola has a brand advertising campaign that associates their product with friends, family, and fun. When you consider what refreshments to serve at a party or bring on a picnic, Coca-Cola wants you to think of them.

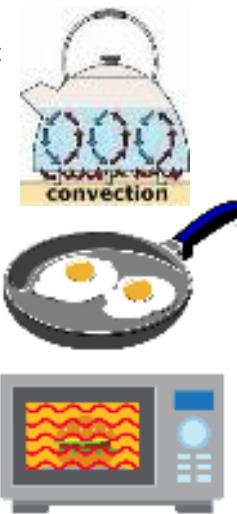
As you create your advertisements, consider what feelings, desires, or goals with which you want your brand to be associated

## Food and Nutrition – Food Preparation skills and Food Science

### Heat Transfer Methods



**Convection** - when heat travels through air or water. E.g. in an oven or a pan of boiling water.



**Conduction** - when heat travels by direct contact through solid materials such as food or metal.

**Radiation** - when heat rays travel towards food, e.g. grilling, toasting, microwaving

Keyword	Meaning
<b>Coagulation</b>	When a liquid protein is heated and becomes solid. E.g. boiling an egg.
<b>Denaturation</b>	When protein foods are heated causing them to change size, colour and texture. E.g. steak, meatballs, chicken.
<b>Dextrinisation</b>	When dry heat causes starch to turn brown. E.g. toasting bread, baking bread.
<b>Garnish</b>	Adding decoration to food to make it more appealing.
<b>Gelatinisation</b>	When liquid is added to starch grains, making them swell. Used to thicken sauces. E.g. custard, cheese sauce.
<b>Reduction</b>	Simmering a liquid over heat until it thickens due to evaporation.

### Skills and Processes Used In Year 9



#### Lemon meringue tart- Shortcrust Pastry (British).

Weighing & measuring. Shortcrust pastry, rubbing in.  
Blind baking. Baking



#### Spring Rolls (Chinese)

Stir frying.



Using filo pastry (must be kept damp during shaping). Baking.



#### Lemon meringue tart – Lemon curd (British).

Weighing & measuring, simmering/ boiling



#### Samosas (Indian)

Flavouring using spices.

Using filo pastry (must be kept damp during shaping). Baking

#### Lemon meringue tart – Meringue (British).

Weighing & measuring. Separating an egg to egg yolk and egg white, whisking, shaping, using a blow torch



#### Breaded Chicken Goujons (British).

Knife skills. Working with a high risk food (chicken).  
Coating. Baking.

## Food and Nutrition– Nutrition and Health and Food Choice

Factors Affecting Food Choice		Many people follow ' <b>special diets</b> '. They have to choose or avoid foods carefully for a range of different reasons.
<b>Cost</b>	Some families have to budget due to low incomes.	
<b>Age Groups</b>	Different age groups have different nutritional needs.	
<b>Health Reasons</b>	E.g. obesity, type 2 diabetes, anaemia, osteoporosis.	
<b>Vegetarian/Vegan</b>	Don't eat meat/Don't eat or use ANY animal products.	
<b>Religion</b>	E.g. Hindu, Muslim, Kosher, Buddhist, Rastafarian etc.	
<b>Intolerances</b>	E.g. intolerance to wheat/gluten, dairy/lactose etc.	
<b>Allergies</b>	E.g. nuts, shellfish, fish, eggs, wheat, dairy etc.	
<b>Allergy V Intolerance</b>		
Allergy	Intolerance	
Immune system	Digestive system	

Keyword	Meaning
<b>Anaemia</b>	Too few <b>red blood cells</b> caused by a lack of <b>iron</b> in the diet.
<b>Bowel Cancer</b>	Can be prevented by eating <b>dietary fibre</b> .
<b>Deficiency</b>	A lack of a particular nutrient in the diet.
<b>Diabetes (Type 2)</b>	Caused by too much <b>processed sugar</b> , obesity and lack of exercise.
<b>Fibre (NSP)</b>	Found in fruit, vegetables, pulses and grains. Helps digest food & remove waste.
<b>Heart Disease (CHD)</b>	When coronary arteries get blocked with fatty deposits.
<b>Malnutrition</b>	Caused by a lack of nutrients in the diet.
<b>Osteoporosis</b>	Brittle bone disease, lack of <b>calcium</b> .
<b>Sodium Chloride</b>	<b>Salt</b> – linked to strokes and heart attacks.
<b>Saturated Fat</b>	Raises <b>cholesterol</b> and can be harmful.
<b>Tooth Decay</b>	Caused by plaque and too much <b>sugar</b> .



## Macronutrients - We need these in large amounts.

Nutrient	Key Information	Main Functions in Body	Foods
<b>Carbohydrates</b>	Breaks down into starch and sugar. 1/3 of our diet should consist of starchy carbs. Wholegrain versions are higher in fibre.	Starch (complex carbohydrate) – Gives slow release energy. Fibre – Helps digestive system. Sugar (simple carbohydrate) – Gives fast energy.	Potatoes, bread, pasta, cereals, rice. (choose wholegrain versions to get more fibre).
<b>Protein</b>	Broken down into HBV (mainly from animal sources) and LBV (from plant sources) proteins.	Growth, repair and of muscles and cells. Body chemicals (hormones & enzymes). Secondary source of energy.	Meat, fish, eggs, nuts, seeds, pulses, lentils.
<b>Fat</b>	Broken down into saturated and unsaturated fats. Saturated fats are bad if eaten in large amounts.	Insulates our vital organs (heart, lungs etc) and keeps us warm. Gives concentrated energy.	Butter, lard, margarine, sunflower oil, olive oil etc.

## Micronutrients - We need these in small amounts.

Vitamins	Minerals
<b>Fat Soluble (dissolve in fat)</b> - A, D, E, K	Calcium, Iron, Sodium, Phosphorus, Potassium, Magnesium, Zinc.
<b>Water Soluble (dissolve in water)</b> - B Vitamins and Vitamin C	

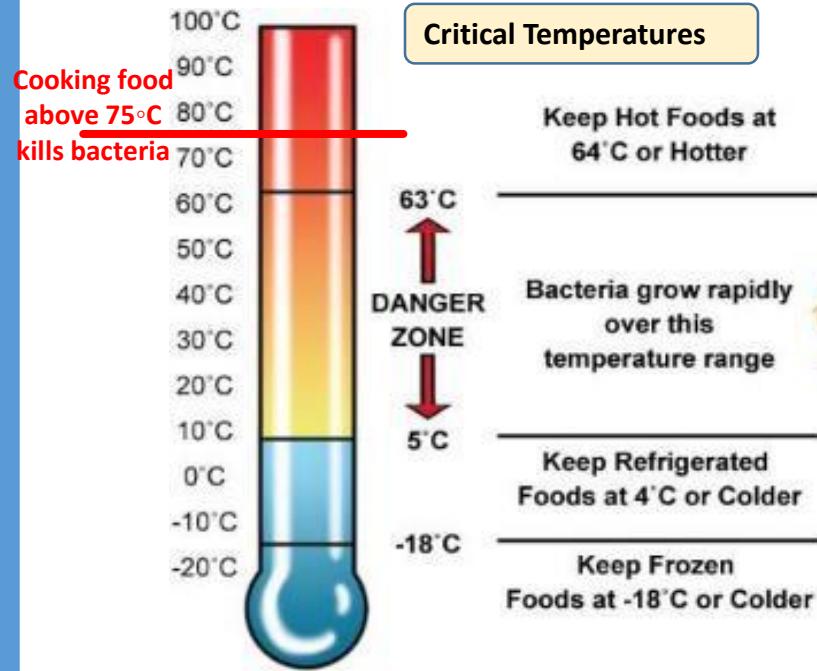
## Food and Nutrition – Food Safety

**Temperature Probe**



**Cooked food**  
needs to reach  
**75°C.**

## HIGH RISK FOOD CAUSES most food poisoning cases



### High Risk Foods

**High Risk Foods** have a short shelf life. You can't keep them for long, or the **bacteria** might multiply to dangerous levels and cause **food poisoning**.



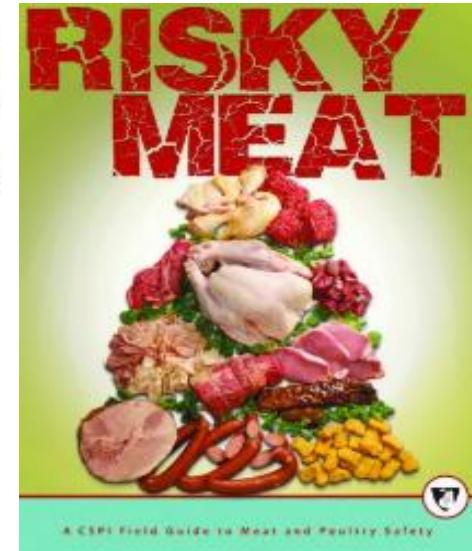
### High Risk Foods

Meat  
Poultry  
Fish  
Seafood  
Shellfish



Eggs  
Dairy Foods  
Gravies  
Sauces  
Stocks

Cooked Rice



## Food Poisoning Pathogens

Name of Pathogen	Time of Symptoms Appearing	Symptoms	Foods that contain pathogen	Image of the Pathogen
Salmonella (Bacteria)	12-72 hours	Diarrhea, Fever, Stomach Cramps, Vomiting	Eggs, Raw or Uncooked Meat and Chicken, Unpasteurized Milk, Cheese, Raw Fruit and Veggies	
E-Coli (Bacteria)	3-4 days after exposure, but may be effective from 1-10 days	Chronic Stomach Cramps, Bloody Diarrhea, Vomiting, Fever	Raw/Undercooked Ground Beef, Unpasteurized Raw Milk or Juice, Raw Veggies Including Sprouts and Lettuce, Contaminated Water	

## Food and Nutrition – Food Provenance and food choice

### Foods and Cuisines from Around The World



A **cuisine** is a style of cooking from a particular country or region of the world. Different cuisines have different ingredients, styles and preparation & cooking techniques. Some examples are shown below.

**Staple foods** are crops that grow in particular parts of the world due to their climate and conditions. E.g. wheat in Europe, rice in Asia or maize in South America.



Roast dinner. Fish & Chips. Bakewell Tart.



Japan



Sushi. Ramen. Udon noodles. Jasmine Rice.



Italy



Pizza, Pasta, Lasagne, Risotto, Gelato.

China



Spring Rolls. Stir fry. Sweet & Sour. Chow Mein.



India



Samosas, Curries, Tandoori Chicken, Nan Breads



Mexico



Chilli Con Carne, Burritos, Tacos, Salsa, Guacamole



### Environmental Issues With Food Production

#### Environment

Refers to the air, water and land where people and animals live.

#### Sustainability

We need to look after our environment by using less energy, reducing the consumption of water, avoiding waste and recycling/reusing as much as possible.

#### Carbon footprint

A measure of the impact your personal lifestyle has on the environment (including your food choices).

#### Landfill

Nearly a third of all food we produce ends up in landfill sites where it gives off methane gas as it decomposes. This adds to carbon emissions.

**Composting** - Left over food can be composted for the garden. (vegetable peelings, fruit waste, teabags, eggshells, toilet roll tubes, egg boxes etc). **Meat, fish and dairy products cannot be composted.**



## 5 ways to reduce your carbon FOODPRINT

### 1 only buy what you need

30-50% of everything we buy ends up in landfill

### 2 eat less meat and dairy

70% of the world's footprint is from animal products

### 3 eat less processed food

the more processed a food is, the bigger its footprint

### 4 buy local and in season

these foods have travelled less and stored less

### 5 grow your own food

the ultimate in local, seasonal, unprocessed food

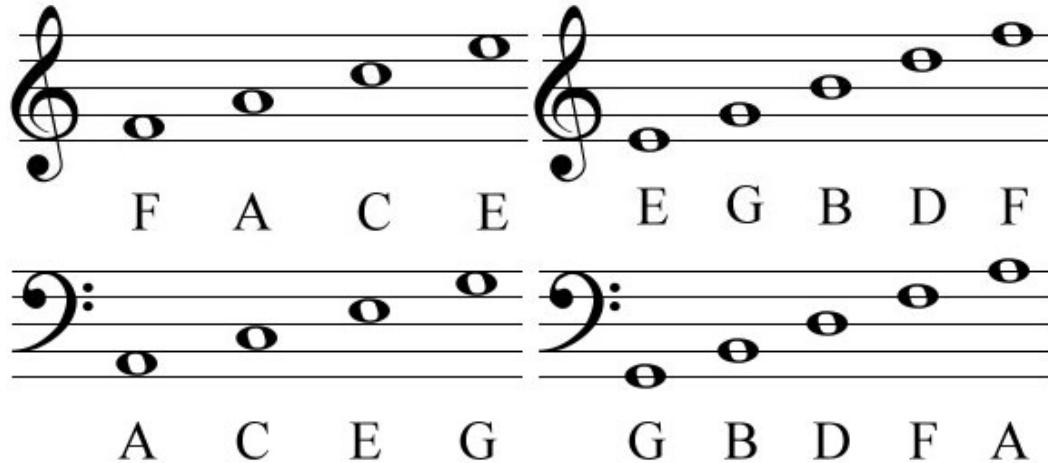


**Reuse** left over food to make another dish. E.g. left over chicken in a curry, fruit in a smoothie.

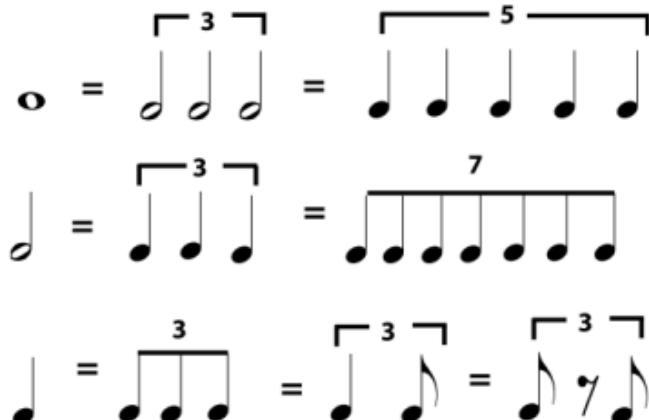
**Recycle/reduce** as much packaging as you can. Reuse jars/containers, use bags for life, avoid buying over packaged food.

## Music Theory Revisited

### Notes of the Treble & Bass Clef



### Triplets



Key Terms	Definitions
TIME SIGNATURE	How many beats there are in a bar
KEY SIGNATURE	What sharps and flats there are in a piece
CHORD	2 or more notes played together at the same time
INTERVAL	The distance between two notes
STACCATO	Notes to be played short and sharp
SLUR	Notes to be played smoothly and together (legato)
CODA	A section added to the end of a piece
DURATION	The length of a note

### Note Duration

Duration			
Note	Name	Length	Rest
●	Semibreve	4 Beats	— — — —
○	Dotted Minim	3 Beats	
○	Minim	2 Beats	— —
○	Dotted Crotchet	1 ½ Beats	
○	Crotchet	1 Beat	— —
○	Quaver	½ Beat	— —
○	Semiquaver	¼ Beat	— — — —

## Music Theory Revisited

### Symbols

	<i>Accent; play forcefully</i>	<b>Largo</b>	<i>Very slow and broad</i>
<b>Adagio</b>	<i>Slow and expressive</i>	<b>Lento</b>	<i>Play slowly</i>
<b>Andante</b>	<i>Moderately slow</i>		<i>Loure; lightly pulse notes in one bow</i>
<b>Allegro</b>	<i>Fast and lively</i>		<i>Mezzo forte; play moderately loud</i>
<i>arco</i>	<i>Play with the bow</i>		<i>Mezzo piano; play moderately soft</i>
	<i>Bow lift; lift bow &amp; return to its starting point</i>		<i>Piano; play softly</i>
<i>cantabile</i>	<i>Play in a singing style</i>		<i>Pianissimo; play very softly</i>
	<i>Crescendo (cresc.); gradually play louder</i>		<i>Pizzicato; pluck the strings</i>
	<i>Decrescendo; gradually play softer</i>		<i>Ritard; gradually play slower</i>
	<i>"detache lance;" slightly separate notes</i>		<i>Staccato; play shortened &amp; separated</i>
	<i>Diminuendo; gradually play softer</i>		<i>Slur; smoothly connect notes in 1 bow</i>
	<i>Down bow; begin bow at the frog</i>		<i>Shurred staccato; slightly pause between each note</i>
	<i>Fermata; pause or hold the note</i>		<i>Tenuto; play sustained or broadly</i>
<b>Fine</b>	<i>Ending of a section of music</i>		<i>Tie; connect 2 or more notes of the same pitch with one bow</i>
<b>f</b>	<i>Forte; play loudly</i>		<i>Trill; rapidly alternate the principal note with a note 1/2 or 1 whole step higher</i>
<b>ff</b>	<i>Fortissimo; play very loudly</i>		<i>Up bow; begin bow at the tip</i>

### Time Signatures

SIMPLE TIME			
	Duple Time: Two beats in each bar	Triple Time: Three beats in each bar	Quadruple Time: Four beats in each bar
Crotchet (quarter note) beat = 1	2 4	3 4	4 4
Minim (half note) beat = 1	2 2	3 2	4 2
Quaver (eighth note) beat = 1	2 8	3 8	4 8

## Compound Time Signatures

Divide the number of pulses by THREE to find the number of beats in each bar!!

**6**

The number of pulses in each measure.

There are six pulses in every measure.

Group pulses into sets of three =

**1/8**

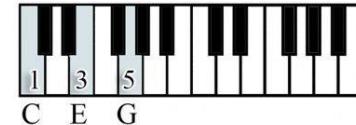
The eighth note is one pulse.

There are two beats in each measure.

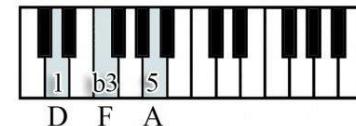
**8**

### Chords

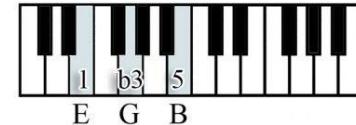
C Major



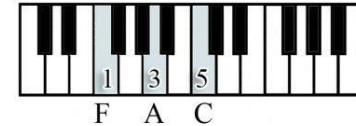
D minor



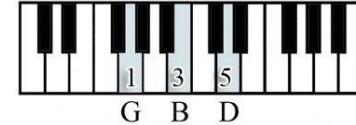
E minor



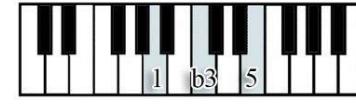
F Major



G Major



A minor



## The Football Pitch



### Key terminology

**Passing** - Sending the ball to another player

**Receiving** - Getting the ball from another player

**Dribbling** - Running with the ball in an attempt to beat an opponent

**Jockeying** - Is the defender's skill of keeping between the attacker and their intended target (usually the goal)

**Tackling** - To dispossess an opponent of the ball

**Marking** - A way to prevent your opponent from receiving or passing the ball, or taking a shot

**Attacking** - Making an attempt to score

**Crossing** - A cross is a medium to long range pass from a wide area of the field towards the opposition's goal

**Shot** - Attempting to score a goal

**Offside** - Moving into an area where you're not permitted

**Interception** - Preventing a pass between players

# Football

### Lesson Overview

1. Passing and receiving
2. Dribbling and turns
3. Shooting
4. Heading
5. Attacking Principles
6. Defending Principles
- 7-10 Conditioned games

KS3



**Goalkeeper** - To prevent the opposing team from scoring.

**Defenders** - A defender is an outfield player whose primary role is to prevent the opposing team from scoring goals.

**Midfielders** - Midfielders are generally positioned on the field between their team's defenders and forwards.

**Forwards** - Forwards are the players on a football team who play nearest the opposing team's goal, and are therefore the most responsible for scoring goals.



### Rules of the Game

**Starting the game** - The game begins with the toss of a coin, and the winning captain decides which goal they wish to defend.

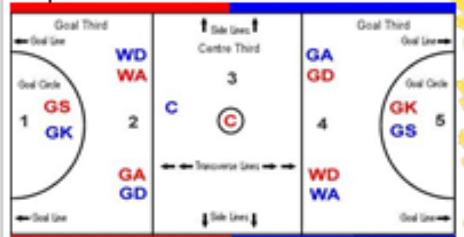
**Method of scoring** - A goal is scored when the ball has completely crossed the goal line, provided that no other infringements have taken place.

**Fouls** - A foul has been committed if a player trips, kicks, pushes, charges another player recklessly, striking of any kind, makes a tackle but connects with the player before the ball, deliberately handles the ball, obstructs an opponent or prevents them from releasing the ball.

**Free kicks** - Used to restart play after a foul or infringement has taken place. They are usually taken from the place from which the offence was committed. Free kicks can be direct (where the free kick taker may score directly) or indirect (where the free kick taker and a second player must touch the ball before a goal can be scored).

**Penalty kick** - A penalty kick is awarded for a foul committed by a defending player in their own penalty area. The kick is taken from the penalty spot and all other players except for the goal keeper and penalty taker must be at least 12 yards from the spot.

## The Netball Court



### Lesson Overview

1. Footwork
2. Passing and receiving
3. Timing of pass
4. Attacking play
5. Shooting
6. Defensive play
7. Assessment

### Footwork

A player can receive the ball...

1. With both feet grounded or jump to catch the ball and land with both feet at the same time. The player can then choose one foot to move (not both).
2. Landing on one foot then the other. The first foot is the landing foot and this foot cannot be moved, other than to pivot on the spot. The second foot can move.

If you break the footwork rule, a free pass will be awarded to the other team.

### Key Vocabulary



- Passing** - sending the ball
- Receiving** - catching the ball
- Footwork** - how you land when in control of the ball
- Dodging** - a way to change direction quickly
- Defending** - preventing the other team from gaining possession of the ball and scoring
- Attacking** - making an attempt to score
- Marking** - a way to prevent your opponent from receiving or passing the ball or shooting
- Shoot** - attempt to score a goal
- Offside** - moving into an area where you're not permitted
- Interception** - preventing a pass between players
- Throw in** - a free pass taken off court
- Centre Pass** - taken to start or restart the game
- Free Pass** - awarded when there is an infringement of the rules by a player
- Penalty Pass** - as above, when two players are involved
- Goal Third & Centre Third** - areas of the court

# Netball



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### Player Positions

**Goal Shooter (GS)** - To score goals and to work in and around the circle with the GA.

**Goal Attack (GA)** - To feed and work with the GS and to score goals.

**Wing Attack (WA)** - To support the circle players, giving them shooting opportunities.

**Centre (C)** - To take the centre pass and to link the defence and the attack.

**Wing Defence (WA)** - To look for interceptions and prevent the WA from feeding the circle.

**Goal Defence (GD)** - To win the ball and reduce the effectiveness of the GA.

**Goal Keeper (GK)** - To work with the GD and to prevent the GA/GS from scoring goals.

### Rules of the Game

**Held ball** - A player is only allowed to hold the ball for 3 seconds. A free pass is awarded to the opposing team if the ball is held for longer than 3 seconds.

**Obstruction** - A player attempting to intercept the ball must be at least 3ft away from the player with the ball. The distance is measured from the landing foot of the player with the ball. If you are closer than 3ft, a penalty pass will be awarded.

**Contact** - This occurs when a player's actions interfere with an opponent's play, this can be accidental or deliberate. This includes; physical contact, using any part of the body to limit an opponent's ability to move freely (pushing, tripping or holding), placing a hand on the ball held by an opponent, removing it from an opponent's possession or pushing the ball into an opponent when holding it.

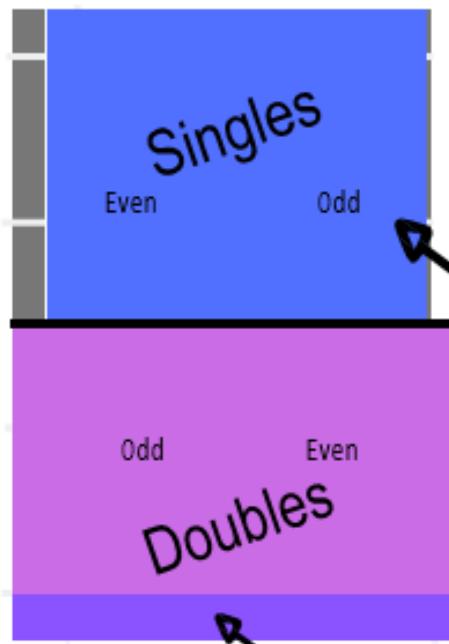
**Over a third** - The ball cannot be thrown over a complete third without being touched or caught by a player. A free pass shall be taken from where the ball crossed the second line (i.e. where the ball shouldn't have been).

**Replayed ball** - A player can not toss the ball into the air and catch it again without it being touched by another player, catch a rebound from a shot on goal if it has not touched the post or another player, or pick it up again after losing control if it has not been touched by another player.

**Offside** - A player with or without the ball cannot move into an area of the court that is not designated for their position. This will result in a free pass to the other team.



## The Court Markings



The back tramlines are out on the serve in doubles but in for the rest of the point

A game of badminton is played to 21 points (This can sometimes be shortened to 15 or 11). If the game is tied at 20-20 the game must be won by two clear points. For example 22-20 or 25-23. If the game isn't won by 2 clear points it's the first player to reach 30.

If a player's body or racquet touches the net before the shuttle lands it is the other player's point.

# Badminton

### Singles

- The player who wins the point serves.
- If the server is on an even number, they serve from the right. If they are on an odd number they serve from the left.

Service line - the serve must land on or past this line

### Doubles

- The team that win the point serve.
- If the serving team are on an even number, it is the player who is in the right box who serves. That player keeps serving until that team lose a point. E.G if a team are on 2, the player on the right serves, if they win the next point, that player changes side and serves from the left box because 3 is odd.

### Lesson Overview

1. Forehand/Backhand serve
2. Midcourt hit
3. Forehand/Backhand net shot
4. Overhead dropshot
5. Overhead clear
6. Smash
7. Singles play
8. Doubles play



KS3

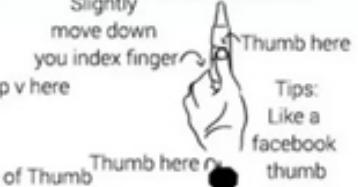
## The Grips

### Forehand Grip



Tips:  
Like shake hand with the racket  
A deep v here  
Index Finger → Side of Thumb

### Backhand Grip



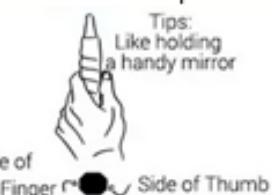
Slightly move down you index finger  
Thumb here  
Tips:  
Like a facebook thumb  
Thumb here  
Side of Thumb

### Smash Grip



Tips:  
Like holding a stick  
Side of Index Finger → Side of Thumb

### Panhandle Grip



Tips:  
Like holding a handy mirror  
Side of Index Finger → Side of Thumb

### Key terminology

**Forecourt** - The front third of the court

**Midcourt** - The middle third of the court

**Rearcourt** - The back third of the court

**Clear** - A shot hit deep into the opponent's court

**Dropshot** - A shot that just drops over the net

**Smash** - A powerful overhead shot

**Net shot** - A shot hit from the forecourt that just drops over the net

**Midcourt hit** - A flat, attacking shot that goes from midcourt to midcourt.



## The Rules

**Starting a game:** Service is decided by a coin toss.

**Service:**

The player serving must stand with the ball held behind the end line of the table.

The ball must be held over the height of the table in the palm of the free hand.

The server must toss the ball without spin upwards at least 16cm

The server cannot obstruct the sight of the ball, the opponent and umpire must have a clear view of the ball at all times.

When serving, the ball must bounce once on the server's side and then bounce at least once on the opponent's side. If the ball strikes the net but does not strike the opponent's half of the table, then a point is awarded to the opponent.

However, if the ball hits the net, but goes over and bounces on the other side, it is called a let. Play stops and the ball must be served again. A player may commit any number of lets without a penalty.

**Returning service:**

To make a good return of service the ball must be returned before it bounces twice on your side of the table.

**Hitting the ball:**

The ball must be hit so that it passes over or around the net.

If a player cannot return a hit over or around the net so that the ball bounces on the opposite side of the table, the player loses the point.



# Table Tennis

## Gripping the Bat



### Key Terminology

**Backhand:** A shot done with the racket to the left of the elbow for a right hander, the reverse for a left hander.

**Backspin:** Backward spin placed on the ball.

**Closed:** Holding the racket such that the racket's hitting surface is aimed downward, with the top edge leaning away from you.

**Cross-table:** A ball that is hit diagonally from corner to corner.

**Dead:** A ball without any spin.

**Drive:** The basic topspin shot or smash executed close to the table.

**Forehand:** Any shot done with the racket to the right of the elbow for a right hander, the reverse for a left hander.

**Game:** Set. Each game is played to 11 points unless a deuce occurs.

**Game Point:** Last point of a game.

**Let:** Service ball hitting the net or a distraction that causes the point played over.

**Open:** Holding the racket such that the racket's hitting surface is aimed outward, with the top edge leaning towards you.

**Push:** A push is an underspin shot executed over the table, and usually close to the net. This is a passive shot that is used when it is impossible to attack a ball.

**Rally:** The period in which the ball is in play.

**Shake hand:** The most popular grip. It gives the best balance of forehand and backhand.

**Spin:** The rotation of a ball.

**Topspin:** Spin placed on a ball to allow it to curve down onto the table.

**Stroke:** Any shot used in the game, including the serve.

**Topspin:** Spin placed on a ball to allow it to curve down onto the table.