

**Y11 A Christmas Carol by Charles Dickens, Knowledge Organiser**

**Exam Paper Overview:**

Literature Paper 2: A Christmas Carol is on the Literature Paper 2 exam. This part of the exam is usually 1 hour, however, this year you will have 1 hour 20 minutes to respond to the novel question.

**Dickens' Intentions and Ideas**

Dickens' writing criticised economic, social, and moral issues in the Victorian era. He showed compassion and empathy towards the vulnerable and disadvantaged people in English society, and help to bring about several important social reforms. Dickens' deep social commitment and awareness of social issues come from his traumatic childhood, where his father was imprisoned for debt, and he was forced to work in a shoe-blackening factory at 12 years old. In his adult life, Dickens developed a strong social conscience and empathised with the victims of social and economic injustice. Dickens' intention in A Christmas Carol is to draw readers' attention to the plight of the poor and to highlight the hypocrisy of Victorian society. He juxtaposes the wealth and greed of capitalists with the poorer classes and draws attention to the way in which the greed and selfishness of some impacts on the quality of the lives of others. His moral message appears to be that we should care for our fellow man. The transformation of Scrooge suggests that Dickens feels it is never too late for change and redemption. Dickens emphasises the importance of family, friendship and charity in bringing about this change.

**Stave Summaries**

<b>Stave 1</b>	<b>Stave 2</b>	<b>Stave 3</b>	<b>Stave 4</b>	<b>Stave 5</b>
<p>1. Introduced to Ebenezer Scrooge on Christmas Eve. He is a lonely miser obsessed with money. He won't pay to heat the office properly – meaning Bob Cratchit is very cold.</p> <p>2. We learn Jacob Marley, Scrooge's business partner, died exactly 7 years earlier.</p> <p>3. Scrooge is irritated that Christmas Day seems to be interrupting his business.</p> <p>4. Scrooge is visited by his nephew Fred, who invites his uncle to Christmas dinner. Scrooge refuses.</p> <p>5. Scrooge is visited by two charity workers, asking for donations. Scrooge refuses and exclaims he wants to be left alone.</p> <p>6. Scrooge allows Bob to have Christmas Day off.</p> <p>7. Scrooge, when he is home, is visited by the Ghost of Jacob Marley – warning him he will be visited by three more ghosts to help him change his ways.</p>	<p>1. Scrooge is visited by the Ghost of Christmas Past who takes him to witness his past.</p> <p>2. Scrooge is taken first to his schoolboy years and he is reminded how his friends would go home from Christmas while he was left at school.</p> <p>3. We see him with his sister, who one year took him home for the holidays.</p> <p>4. Next we are shown Scrooge as a young apprentice, working for Fezziwig. Dickens describes the Christmas ball Fezziwig organised for his employees.</p> <p>5. Finally, Scrooge is taken to see his ex-fiancée, Belle. We see the scene when they break up, as money has taken over Scrooge's life.</p> <p>6. Scrooge cannot bear to see any more and struggles with the spirit.</p>	<p>1. Scrooge is then visited by the Ghost of Christmas Present.</p> <p>2. The spirit shows Scrooge how the Cratchit family celebrate Christmas. Scrooge asked if Tiny Tim will live. The spirit explains unless there are changes, he will die. The spirit reminds Scrooge of his earlier words: 'If he is to die, he had better do it, and decrease the surplus population'</p> <p>3. Scrooge is then taken to see how others celebrate Christmas: miners, lighthouse workers, sailors on a ship.</p> <p>4. He is then taken to Fred's house at Christmas, where they are playing games.</p> <p>5. The spirit then begins to age, and see under the spirit's robes two children: Want and Ignorance.</p> <p>6. The Ghost of Christmas Future then appears</p>	<p>1. The Ghost of Christmas Future is described.</p> <p>2. The spirit takes Scrooge to see a group of businessmen discussing someone who has died.</p> <p>3. Scrooge is then taken to see Old Joe, where he is in the process of buying property of the dead man – which have been stolen.</p> <p>4. Scrooge then returns to Bob Cratchit's house, where it is revealed Tiny Tim has died.</p> <p>5. Scrooge is then taken to the graveyard and is shown a grave stone and realises this is for him.</p> <p>6. Scrooge falls to his knees and begs that he will change his ways.</p>	<p>1. Scrooge wakes up in his own bed.</p> <p>2. Scrooge wonders how much time has passed and calls to a boy. He then sends the boy to the poulterer for the prize turkey to give to Bob Cratchit,</p> <p>3. Scrooge meets one of the charity collectors from earlier and whispers to him that he will give a large donation.</p> <p>4. Scrooge then goes to Fred's house and is welcomed in. He enjoys the dinner and party.</p> <p>5. On Boxing Day, Scrooge arrives early to work, and plays a trick on Bob. Scrooge then tells him he is going to raise his salary and promises to help Bob's struggling family.</p> <p>6. Scrooge is described to have completely changed and becomes a 'second father' to Tiny Tim – 'who did not die.'</p>

Assessment Overview: Part A and Part B: 1 hour	Language	Structure and Form	Characters	Themes
<p><b>Part A:</b> You are given an extract from the novella. You need to analyse how Dickens presents a character or relationship.</p> <p><b>Criteria:</b> 3 paragraphs Clear point Embed evidence Include language, structure and form Explain what the quote shows Analyse the techniques Refer to reader</p> <p><b>Part B:</b> After the extract, you are given a theme shown in the novella.</p> <p>You need to refer to events elsewhere in the novella which relate to that theme.</p> <p><b>Criteria:</b> 3-4 paragraphs Clear point Event description Explain what the event shows Explain how it shows the theme Explain why it is significant Reader effect</p>	<p><b>Alliteration</b> <b>Triple Emphasis</b> <b>Satire</b>- use of humour or ridicule to criticise <b>Simile</b>- comparing using 'like' or 'as' <b>Metaphor</b>- saying one thing is another <b>Personification</b>- make object human <b>Pathetic fallacy</b>- weather to create mood <b>Pathos</b>- language to evoke pity <b>Allusion</b>- reference to another literary work <b>Hyperbole</b>- exaggerated statement <b>Connotation</b>- associated meaning of word <b>Characterisation</b>- built up description of character in text <b>Semantic field</b>- words related in meaning <b>Imagery</b>- visually descriptive language. <b>Noun</b>: Name of person, place, thing <b>Adjective</b>: Describes noun <b>Determiner</b>: Gives information about the noun: <i>the/a/every/some</i> <b>Abstract Noun</b>: An idea/concept <i>love/anger</i> <b>Concrete Noun</b>: Something you can touch/hold <b>Verb</b>: Doing word <b>Adverb</b>: Describes verb <b>Modal Verb</b>: Gives information about the verb: <i>should/could/might</i> <b>Imperative Verb</b>: A command <b>Pronoun</b>: In place of noun <i>I/he/it/they</i> <b>Preposition</b>: Tells you where something is <i>on/over/under</i> <b>Conjunction</b>: A connective <i>and/or/but/although</i> <b>Superlative</b>: The most extreme version <i>tallest/smallest</i></p>	<p><b>Order of ideas</b>: Thinking about what the writer started/finished with; why they saved something until last or shared it early on. <b>Paragraph length</b>: Is it particularly long/short? <b>Sentence length</b>: As above. <b>Simple sentence</b>: A sentence with only one subject and one verb: <i>The cat sat on the chair.</i> <b>Compound sentence</b>: Two main clauses joined with a connective that both make sense independently: <i>The cat sat on the chair and the man sat on the floor.</i> <b>Complex sentence</b>: A sentence with a main clause and a subordinate clause: <i>The cat, who was spoilt, sat on the chair whilst the man sat on the floor.</i> <b>Punctuation</b>: Consider how these devices have been used <b>Juxtaposition</b>: Two opposite ideas used close by one another <b>Repetition</b>: Using the same words, phrase or ideas more than once <b>Main Clause</b>: The main part of a sentence; makes sense on its own. <b>Subordinate Clause</b>: A clause which does not make sense on its own. <b>Conflict</b>- problem faced by characters <b>Resolution</b>- point where conflict is resolved <b>Foreshadowing</b>- clue about something later <b>Foreboding</b>- sense that something will occur <b>Backstory</b>- insight into character's past <b>Exposition</b>- revelation of something <b>Poetic justice</b>- good rewarded bad punished <b>Melodrama</b>- exaggerated characters/events <b>Motif</b>- repeated image or symbol <b>Antithesis</b>- contrast of ideas in same grammatical structure <b>Authorial intrusion</b>- where author pauses to speak directly to reader <b>Allegory</b>- characters/events represent ideas about religion, morals or politics <b>Asyndeton</b>- list without conjunctions <b>Polysyndeton</b>- list with conjunctions (and)</p>	<p><b>1. Ebenezer Scrooge</b>: Miserly, mean, bitter, materialistic, unsympathetic, indifferent, cold, selfish, isolated, cynical, charitable, value driven, generous, happy, sociable, transformed. <b>2. Marley's Ghost</b>: Materialistic, self-centred, terrifying, haunting, exhausted, direct, reformed, regretful, hopeful, selfless, wise <b>3. Bob Cratchit</b>: Uncomplaining, tolerant, courteous, deferential, patient, civil, eager, pleasurable, good-humoured, playful, caring, tender, cheerful, loving, forgiving. <b>4. Fred</b>: Warm-hearted, empathetic, cheerful, optimistic, even-tempered, insightful, determined, generous, forgiving, jovial, enthusiastic, caring <b>5. Ghost of Christmas Past</b>: Contradictory, strong, gentle, quiet, forceful, questioning, mysterious <b>6. Ghost of Christmas Present</b>: Compassionate, abundant, generous, cheerful, jolly, friendly, severe, sympathetic <b>7. Ghost of Christmas Future</b>: Mysterious, silent, ominous, intimidating, frightening, resolute. <b>8. Tiny Tim</b>: Frail, ill, good, religious</p>	<p>-Family -Loneliness and isolation -Time -Education -Christmas Spirit -Redemption -Poverty -Social responsibility -Supernatural -Poverty -Fate -Charity -Transformation -Capitalism -Greed -Money -Friendship -Religion -Morality - Isolation/Loneliness, -Choices -Memory and the past -Compassion -Forgiveness -Guilt and blame -Time -Rationality</p>

# Year 10 Mathematics Knowledge Organiser (Term 1)

## Two-Way Tables (MW - 61)

Probabilities for two events can be shown in a two-way table.

### Example.

Two dice were rolled, a red dice and a blue dice, and their scores were added up. Find the probability the total score is higher than 8.

Outcomes for the red dice.

Outcomes for the Blue dice.

Outcomes for when they are added together.

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

We can see the probability of getting a score higher than 8 is  $10/36 = 5/18$  (because 10 out of the 36 outcomes are above 8)

## Significant Figure. (MW - 90)

The significant figures of a number are the digits which carry meaning (ie. are significant) to the size of the number.

The first significant figure of a number cannot be zero.

In the number 0.00821, the first significant figure is the 8.

In the number 2.740, the 0 is not a significant figure.

In a number with a decimal, trailing zeros are not significant. 0.00821 rounded to 2 significant figures is 0.0082.

### Example

19357 rounded to 3 significant figures is 19400. We need to include the two zeros at the end to keep the digits in the same place value columns.

## Rounding (MW - 31)

To make a number simpler but keep its value close to what it was. If the digit to the right of the rounding digit is less than 5, round down. If the digit to the right of the rounding digit is 5 or more, round up.

### Example.

74 rounded to the nearest ten is 70, because 74 is closer to 70 than 80.

## Decimal Place (MW - 32)

The position of a digit to the right of a decimal point.

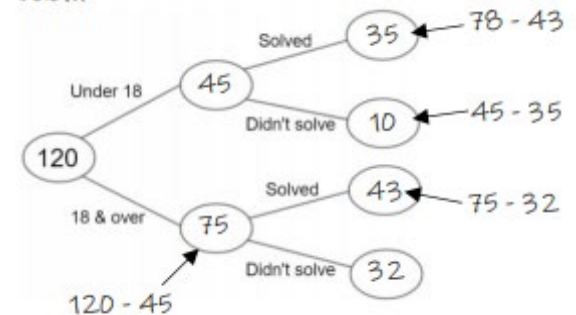
### Example

In the number 0.372, the 7 is in the second decimal place. 0.372 rounded to two decimal places is 0.37, because the 2 tells us to round down. Careful with money - don't write £27.4, instead write £27.40

## Frequency trees (MW - 57)

### Example.

120 people were given 3 minutes to solve a puzzle. 45 of the people who tried to solve the puzzle were under 18 years old. 78 of the people solved the puzzle. 32 of the people aged 18 and over did not solve the puzzle. Complete the frequency tree below.)



The information given in the question determines the order of working. Here, we need to find the 75 first.

## Error Interval (MW - 155 / 206)

A range of values that a number could have taken before being rounded or truncated.

An error interval is written using inequalities, with a lower bound and an upper bound. Note that the lower bound inequality can be 'equal to', but the upper bound cannot be 'equal to'.

### Example

0.6 has been rounded to 1 decimal place. The error interval is:  $0.55 \leq x < 0.65$   
The lower bound is 0.55  
The upper bound is 0.65

# Year 10 Mathematics Knowledge Organiser (Term 1)

## Estimate and Approximation (MW – 91)

We estimate to find something **close to the correct answer**

Example.

An estimate for the height of a man is 1.8 metres.

When using approximations to estimate the solution to a calculation, **round each number in the calculation to 1 significant figure.**  $\approx$  means 'approximately equal to'

Example.

$$\frac{348 + 692}{0.526} \approx \frac{300 + 700}{0.5} = 2000$$

'Note that dividing by 0.5 is the same as multiplying by 2'

## Use of calculator (MW 77)

Use a calculator efficiently for powers, roots and more complex calculations.

Example.

$$\text{Calculate : } \frac{\sqrt[3]{2.3 \times 4.5^2}}{12.45}$$
$$\text{Calculate : } (\sqrt[3]{2.3 \times 4.5})^2$$

Know your keys

$x^2$	Square key
$x^3$	Cube key
$x^{\blacksquare}$	Power key
$\sqrt{\phantom{x}}$	Square root key
$\sqrt[3]{\phantom{x}}$	Cube root key
(-)	Negative key
$\frac{\blacksquare}{\blacksquare}$	Fraction key

## Product of Primes (MW – 78)

Prime Number:

A number with exactly two factors. A number that can only be divided by itself and one.

The number **1 is not prime**, as it only has one factor, not two

Example. The first eight prime numbers are: 2, 3, 5, 7, 11, 13, 17, 19

Prime Factor.

A factor which is a prime number.

Example. The prime factors of 18 are: 2, 3

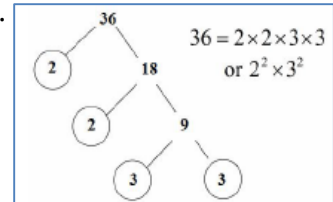
Product of Prime Factors ('Prime factorisation')

Finding out which prime numbers multiply together to make the original number.

Use a prime factor tree.

Example.

Find the product of prime factors of 36.



## Highest Common Factor HCF (MW - 79)

The **biggest** number that **divides exactly** into two or more numbers.

Example.

Here are the factors of 16 and 20.

16	20
1 x 16	1 x 20
2 x 8	2 x 10
4 x 4	4 x 5

The highest number that appears in both lists is 4. So the Highest Common Factor of 16 and 20 is 4

## Lowest Common Multiple LCFM (MW – 80)

The smallest number that is in the times tables of each of the numbers given.

Example.

Here are the multiples of 6 and 8

6 12 18 24 30 36 42 .....

8 16 24 32 40 48 .....

The lowest number in both lists is 24. So the lowest common multiple of 6 and 8 is 24

## Real life Multiples

List multiples of numbers systematically;

- Find common multiples of two numbers;
- Solve problems using LCM in context (time, number of laps, number of items)

Example.

List the first 5 multiples of a given number.

Calculate the LCM of 6 and 20.

Mel wants to equal numbers of pens, pencils and rulers. Pens can be bought in packs of 8, pencils in packs of 12 and rulers in packs of 20. What is the smallest number of pens, pencils and rulers she should purchase?



# Year 10 Mathematics Knowledge Organiser (Term 1)

## **Fraction (MW - 24)**

A mathematical expression representing the division of one integer by another. Fractions are written as two numbers separated by a horizontal line.

### Example

$\frac{2}{7}$  is a 'proper' fraction.

$\frac{9}{4}$  is an 'improper' or 'top-heavy' fraction.

## **Reciprocal**

The reciprocal of a number is 1 divided by the number.

The reciprocal of  $x$  is  $\frac{1}{x}$

### Example

The reciprocal of 5 is  $\frac{1}{5}$

The reciprocal of  $\frac{2}{3}$  is  $\frac{3}{2}$ ,

because  $\frac{2}{3} \times \frac{3}{2} = 1$

When we multiply a number by its reciprocal we get 1.

This is called the 'multiplicative inverse'.

## **Dividing Fractions**

Multiply by the reciprocal of the second fraction.

### Example

$$\frac{3}{4} \div \frac{5}{6} = \frac{3}{4} \times \frac{6}{5} = \frac{18}{20} = \frac{9}{10}$$

## **Numerator**

The top number of a fraction.

### Example

In the fraction  $\frac{3}{5}$ , 3 is the numerator.

## **Denominator**

The bottom number of a fraction.

### Example

In the fraction  $\frac{3}{5}$ , 5 is the denominator

## **Mixed Number**

A number formed of both an integer part and a fraction part.

### Example

$3\frac{2}{5}$  is an example of a mixed number.

## **Fraction of an Amount**

Divide by the bottom, times by the top

### Example

$$\begin{aligned} \text{Find } \frac{2}{5} \text{ of } \pounds 60 \\ 60 \div 5 &= 12 \\ 12 \times 2 &= 24 \end{aligned}$$

## **Unit Fraction**

A fraction where the numerator is one and the denominator is a positive integer.

### Example

$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$  etc. are examples of unit fractions.

## **Simplifying Fractions (MW - 26)**

Divide the numerator and denominator by the highest common factor.

### Example

$$\frac{20}{45} = \frac{4}{9}$$

## **Equivalent Fractions (MW - 25)**

Fractions which represent the same value.

### Example

$$\frac{2}{5} = \frac{4}{10} = \frac{20}{50} = \frac{60}{150} \text{ etc}$$

## **Multiplying Fractions (MW - 73)**

Multiply the numerators together and multiply the denominators together.

### Example

$$\frac{3}{8} \times \frac{2}{9} = \frac{6}{72} = \frac{1}{12}$$

## **Comparing Fractions (MW - 70)**

To compare fractions, they each need to be rewritten so that they have a common denominator. Ascending means smallest to biggest. Descending means biggest to smallest.

### Example

Put in to ascending order :  $\frac{3}{4}, \frac{2}{3}, \frac{5}{6}, \frac{1}{2}$ .

Equivalent:  $\frac{9}{12}, \frac{8}{12}, \frac{10}{12}, \frac{6}{12}$

Correct order:  $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{5}{6}$

## **Adding or Subtracting Fractions (MW - 71)**

Find the LCM of the denominators to find a common denominator. Use equivalent fractions to change each fraction to the common denominator.

Then just add or subtract the numerators and keep the denominator the same.

### Example

$\frac{2}{3} + \frac{4}{5}$   
Multiples of 3: 3, 6, 9, 12, 15..  
Multiples of 5: 5, 10, 15..  
LCM of 3 and 5 = 15

$$\begin{aligned} \frac{2}{3} &= \frac{10}{15} \\ \frac{4}{5} &= \frac{12}{15} \\ \frac{10}{15} + \frac{12}{15} &= \frac{22}{15} = 1\frac{7}{15} \end{aligned}$$

# Year 10 Mathematics Knowledge Organiser (Term 1)

## Ratio (MW – 38)

Ratio compares the size of one part to another part. Written using the ':' symbol.

Example

3 : 1



## Simplifying Ratios

Divide all parts of the ratio by a common factor.

Example

5 : 10 = 1 : 2 (divide both by 5)

14 : 21 = 2 : 3 (divide both by 7)

## Unitary Method (MW – 39)

Finding the value of a single unit and then finding the necessary value by multiplying the single unit value.

Example

3 cakes require 450g of sugar to make.

Find how much sugar is needed to make 5 cakes.

3 cakes = 450g

So 1 cake = 150g (÷ by 3)

So 5 cakes = 750 g (x by 5)

## Ratios in the form 1 : n or n : 1

Divide both parts of the ratio by one of the numbers to make one part equal 1.

Example

5 : 7 = 1 :  $\frac{7}{5}$  in the form 1 : n

5 : 7 =  $\frac{5}{5}$  : 1 in the form n : 1

## Sharing in a Ratio (MW – 106)

1. Add the total parts of the ratio.
2. Divide the amount to be shared by this value to find the value of one part.
3. Multiply this value by each part of the ratio.

Use only if you know the total.

Example

Share £60 in the ratio 3 : 2 : 1.

$$3 + 2 + 1 = 6$$

$$60 \div 6 = 10$$

$$3 \times 10 = 30, 2 \times 10 = 20, 1 \times 10 = 10$$

$$\pounds 30 : \pounds 20 : \pounds 10$$

## Ratio already shared

Find what one part of the ratio is worth using the unitary method.

Example

Money was shared in the ratio 3:2:5 between Ann, Bob and Cat. Given that Bob had £16, found out the total amount of money shared.

£16 = 2 parts So £8 = 1 part

3 + 2 + 5 = 10 parts, so  $8 \times 10 = \pounds 80$

## Best Buys

Find the unit cost by dividing the price by the quantity.

The lowest number is the best value.

Example

8 cakes for £1.28 → 16p each (÷ by 8)

13 cakes for £2.05 → 15.8p each (÷ by 13)

Pack of 13 cakes is best value.

## Proportion (MW – 42)

Proportion compares the size of one part to the size of the whole. Usually written as a fraction.

Example

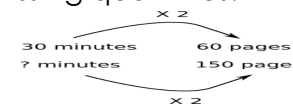
In a class with 13 boys and 9 girls, the proportion of boys is  $\frac{13}{22}$  and the proportion of girls is  $\frac{9}{22}$

## Proportional Reasoning

Comparing two things using multiplicative reasoning and applying this to a new situation.

Identify one multiplicative link and use this to find missing quantities.

Example



## Direct Proportion (MW – 199)

If two quantities are in direct proportion, as one increases, the other increases by the same percentage.  $k$  is the ratio between  $x$  and  $y$

Example

$Y$  is directly proportional to  $x$

When  $x = 500$   $y = 10$

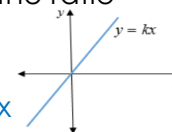
Calculate the value of  $y$  when  $x = 150$   
 $Y = kx$

$10 = 500k$  therefore  $k = 1 / 50$

$Y = 1 / 50 x$

$y = 1 / 50 \times 150$

$y = 3$



# Year 10 Mathematics Knowledge Organiser (Term 1)

## Indirect proportion

If two quantities are in indirect proportion, as one increases, the other decreases by the same percentage.  $1/k$  is the ratio between  $x$  and  $y$

### Example

$P$  is inversely proportional to  $V$

When  $P = 6$   $V = 8$

Calculate the value of  $P$  when  $V = 2$

$P = k/v$   $6 = k/8$  therefore  $k = 48$

$P = 48/2$   $P = 24$

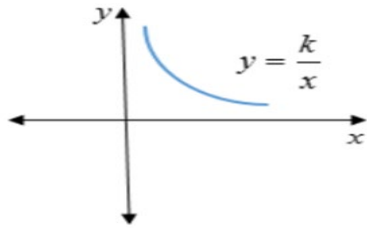
## Inverse proportion (MW – 199)

If two quantities are inversely proportional, as one increases, the other decreases by the same percentage.

If  $y$  is inversely proportional to  $x$ , this can be written as  $y \propto \frac{1}{x}$

An equation of the form  $y = \frac{k}{x}$  represents inverse proportion.

### Example



## Percentages to Fractions

Percentage is just a fraction out of 100.

**Write the percentage over 100** and simplify.

### Example

$$14\% = \frac{14}{100} = \frac{7}{50}$$

## Percentage (MW 40)

**Number of parts per 100.**

### Example

$$31\% \text{ means } \frac{31}{100}$$

## Finding 10% (MW – 86/87)

To find **10%**, **divide by 10**

### Example

$$10\% \text{ of } \pounds 36 = 36 \div 10 = \pounds 3.60$$

## Finding 1% (MW – 86/87)

To find **1%**, **divide by 100**

### Example

$$1\% \text{ of } \pounds 8 = 8 \div 100 = \pounds 0.08$$

## Percentage Change (MW – 109)

$$\frac{\text{Difference}}{\text{Original}} \times 100\%$$

### Example

A games console is bought for  $\pounds 200$  and sold for  $\pounds 250$ .

$$\% \text{ change} = \frac{50}{200} \times 100 = 25\%$$

## Fractions to Percentages (MW – 85)

Percentage is just a fraction out of 100.

**Make the denominator 100 using equivalent fractions.**

When the denominator doesn't go in to 100, use a calculator and **multiply the fraction by 100.**

### Example

$$\frac{9}{17} \times 100 = 52.9\%$$

## Fractions to Decimals (MW – 85)

**Divide the numerator by the denominator** using the bus stop method.

### Example

$$\frac{3}{8} = 3 \div 8 = 0.375$$

## Decimals to Fractions (MW – 85)

**Write as a fraction** over 10, 100 or 1000 and simplify.

### Example

$$0.36 = \frac{36}{100} = \frac{9}{25}$$

## Percentages to Decimals (MW – 85)

**Divide by 100**

### Example

$$8\% = 8 \div 100 = 0.08$$

## Decimals to Percentages (MW – 85)

**Multiply by 100**

### Example

$$0.4 = 0.4 \times 100\% = 40\%$$

## Percentage Increase/decrease Non calculator method (MW – 109)

### Example

Increase/decrease  $\pounds 150$  by 11%

$$10\% \text{ of } \pounds 150 = \pounds 15.00$$

$$1\% \text{ of } \pounds 150 = \pounds 1.50$$

$$11\% \text{ of } \pounds 150 = \pounds 16.50$$

$$\text{Increase} = \pounds 150 + \pounds 16.50 \quad \text{Decrease} = \pounds 150 - \pounds 16.50$$

# Year 10 Mathematics Knowledge Organiser (Term 1)

## Repeated percentage change/increase

### Example

John invests £3000 in a bank that pays 1.5% compound interest. How much will he have after 4 years?

Investment + interest

$$100\% + 1.5\% = 101.5\% = 1.015$$

$$3000 \times 1.015^4 = 3184.09$$

Answer £3184.09

## Reverse percentage (MW – 110)

### Example

Jane buys a pair of trousers in a sale for £68 after they were reduced by 15%. What was the original cost of the trousers?

Trousers now worth 85% of original price

$$85\% = 68$$

$$1\% = 68 \div 85 = 0.8$$

$$100\% = 0.8 \times 100 = 80$$

Original cost = £80

## Repeated percentage change/decrease (MW – 164)

### Example

John buys a car for £17000. It depreciates in value every year by 8%. What will it be worth after 5 years?

Cost - interest

$$100\% - 8\% = 92\% = 0.92$$

$$17000 \times 0.92^5 = 11204.39$$

Answer £11204.39

## Square Number (MW – 81)

The number you get when you **multiply a number by itself**.

### Example

$$1, 4, 9, 16, 25, 36, 49, 64, 81, \\ 100, 121, 144, 169, 196, 225... \\ 9^2 = 9 \times 9 = 81$$

## Square Root (MW – 81)

The **number you multiply by itself** to get another number. The reverse process of squaring a number.

### Example

$$\sqrt{36} = 6$$

**because**  $6 \times 6 = 36$

## Solutions to $x^2 = \dots$ (MW – 81)

**Equations involving squares** have **two solutions**, one **positive** and one **negative**.

### Example

$$\text{Solve } x^2 = 25 \quad x = 5 \text{ or } x = -5$$

This can also be written as  $x = \pm 5$

## Cube Number (MW – 81)

The **number you multiply by itself and itself again** to get another number.

The reverse process of cubing a number.

### Example

$$1, 8, 27, 64, 125...$$

$$2^3 = 2 \times 2 \times 2 = 8$$

## Powers of... (MW – 29 / 131)

The powers of a number are that **number raised to various powers**.

### Example

The powers of 3 are:

$$3^1 = 3, \quad 3^2 = 9, \quad 3^3 = 27, \quad 3^4 = 81 \text{ etc.}$$

## Multiplication Index Law (MW – 82 / 131)

When **multiplying** with the same base (number or letter), **add the powers**.  $a^m \times a^n = a^{m+n}$

### Example

$$7^5 \times 7^3 = 7^8$$

$$a^{12} \times a = a^{13}$$

$$4x^5 \times 2x^8 = 8x^{13}$$

## Division Index Law (MW – 82 / 131)

When **dividing** with the same base (number or letter), **subtract the powers**.  $a^m \div a^n = a^{m-n}$

### Example

$$15^7 \div 15^4 = 15^3$$

$$x^9 \div x^2 = x^7$$

$$20a^{11} \div 5a^3 = 4a^8$$

## Brackets Index Laws (MW – 82 / 131)

When raising a power to another power, multiply the powers together.  $(a^m)^n = a^{mn}$

### Example

$$(y^2)^5 = y^{10}$$

$$(6^3)^4 = 6^{12}$$

$$(5x^6)^3 = 125x^{18}$$

## Notable Powers (MW – 29)

$$p = p^1$$

$$p^0 = 1$$

### Example

$$99999^0 = 1$$

# Year 10 Mathematics Knowledge Organiser (Term 1)

## **Negative Powers (MW – 29)**

A negative power performs the reciprocal.

$$a^{-m} = \frac{1}{a^m}$$

### **Example**

$$3^{-2} = \frac{1}{3^2} = \frac{1}{9}$$

## **Fractional Powers (MW – 188)**

The denominator of a fractional power acts as a 'root'. The numerator of a fractional power acts as a normal power.

$$a^{\frac{m}{n}} = (\sqrt[n]{a})^m$$

### **Example**

$$27^{\frac{2}{3}} = (\sqrt[3]{27})^2 = 3^2 = 9$$

$$\left(\frac{25}{16}\right)^{\frac{3}{2}} = \left(\frac{\sqrt{25}}{\sqrt{16}}\right)^3 = \left(\frac{5}{4}\right)^3 = \frac{125}{64}$$

## **Simplifying Expressions**

Collect 'like terms'.

Be careful with negatives.

$x^2$  and  $x$  are not like terms.

### **Example**

$$2x + 3y + 4x - 5y + 3 = 6x - 2y + 3$$

$$3x + 4 - x^2 + 2x - 1 = 5x - x^2 + 3$$

## **x times x**

The answer is  $x^2$  not  $2x$ .

### **Example**

Squaring is multiplying by itself, not by 2.

## **p × p × p**

The answer is  $p^3$  not  $3p$

### **Example**

If  $p=2$ , then  $p^3=2 \times 2 \times 2=8$ , not  $2 \times 3=6$

## **Expression**

A mathematical statement written using **symbols, numbers** or **letters**,

### **Example**

$$3x + 2 \text{ or } 5y^2$$

## **Equation**

A statement showing that **two expressions are equal**

### **Example**

$$2y - 17 = 15$$

## **Identity**

An equation that is **true for all values** of the variables

An identity uses the symbol:  $\equiv$

### **Example**

$$2x \equiv x+x$$

## **Formula**

Shows the **relationship** between **two or more variables**

### **Example**

Area of a rectangle = length x width or  $A = L \times W$

## **Expand (MW – 93)**

To expand a bracket, **multiply** each term **in the bracket** by the expression **outside** the bracket.

### **Example**

$$3(m + 7) = 3m + 21$$

## **p + p + p**

The answer is  $3p$  not  $p^3$

### **Example**

If  $p=2$ , then  $2+2+2=6$ , not  $2^3 = 8$

## **Factorise (MW – 94)**

The **reverse** of **expanding**.

Factorising is writing an expression as a product of terms by '**taking out**' a **common factor**.

### **Example**

$$6x - 15 = 3(2x - 5),$$

where 3 is the common factor.

## **Linear Sequence**

A number pattern with a **common difference**.

### **Example**

2, 5, 8, 11... is a linear sequence

## **Term**

**Each value** in a sequence is called a term.

### **Example**

In the sequence 2, 5, 8, 11...  
8 is the third term of the sequence.

## **Term-to-term rule (MW – 37)**

A rule which allows you to **find the next term** in a sequence if you **know the previous term**.

### **Example**

First term is 2. Term-to-term rule is 'add 3'  
Sequence is: 2, 5, 8, 11...

## **nth term (MW – 102/103)**

A rule which allows you to **calculate the term** that is in the **nth position** of the sequence. Also known as the 'position-to-term' rule. **n** refers to the **position** of a term in a sequence

### **Example**

nth term is  $3n - 1$

The 100<sup>th</sup> term is  $3 \times 100 - 1 = 299$

# Year 10 Mathematics Knowledge Organiser (Term 1)

## Finding the nth term of a linear sequence

(MW – 102/103)

1. Find the **difference**.
2. **Multiply that by  $n$** .
3. Substitute  $n = 1$  to **find out what number you need to add or subtract to get the first number in the sequence**.

### Example

Find the nth term of: 3, 7, 11, 15...

1. Difference is +4
2. Start with  $4n$
3.  $4 \times 1 = 4$ , so we need to subtract 1 to get 3.  
nth term =  $4n - 1$

## Geometric Sequence (MW – 163)

A sequence of numbers where each term is found by **multiplying the previous one** by a number called the **common ratio,  $r$** .

### Example

An example of a geometric sequence is:

2, 10, 50, 250 ...

The common ratio is 5

Another example of a geometric sequence is:

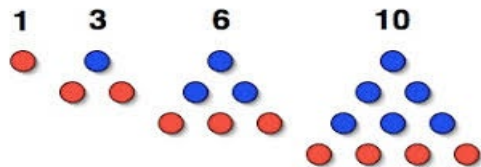
81, -27, 9, -3, 1 ...

The common ratio is  $-\frac{1}{3}$

## Triangular numbers

The sequence which comes from a pattern of dots that form a triangle.

### Example



## nth term of a quadratic sequence

(MW – 213)

1. Find the first and second differences.
2. Halve the second difference and multiply this by  $n^2$ .
3. Substitute  $n = 1, 2, 3, 4 \dots$  into your expression so far.
4. Subtract this set of numbers from the corresponding terms in the sequence from the question.
5. Find the nth term of this set of numbers.
6. Combine the nth terms to find the overall nth term of the quadratic sequence.

Substitute values in to check your nth term works for the sequence.

### Example

Find the nth term of: 4, 7, 14, 25, 40..

Answer:

Second difference = +4  $\rightarrow$  nth term =  $2n^2$

Sequence: 4, 7, 14, 25, 40

$2n^2$       2, 8, 18, 32, 50

Difference: 2, -1, -4, -7, -10

Nth term of this set of numbers is  $-3n + 5$

Overall nth term:  $2n^2 - 3n + 5$

## nth term of a geometric sequence

(MW – 163)

$$r^{n-1}$$

where  $a$  is the first term and  $r$  is the common ratio

### Example

The nth term of 2, 10, 50, 250 ... is

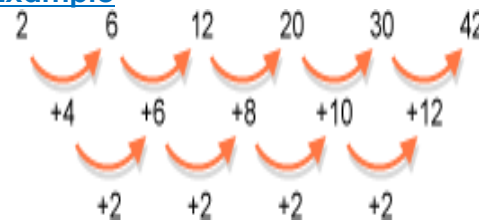
$$2 \times 5^{n-1}$$

## Quadratic Sequence (MW – 213)

A sequence of numbers where the **second difference is constant**.

A quadratic sequence will have a  $n^2$  term.

### Example



## Fibonacci type sequences

(MW – 141)

A sequence where the next number is found by **adding up the previous two terms**

### Example

The Fibonacci sequence is:

1, 1, 2, 3, 5, 8, 13, 21, 34 ...

An example of a Fibonacci-type sequence is:

4, 7, 11, 18, 29 ...



# Year 10 Mathematics Knowledge Organiser (Term 1)

## (Unit 27 – Solving Equations & Unit 28/29 Forming and Solving Equations)

### Solve (MW – 135a)

To find the **answer**/value of something

**Use inverse operations** on both sides of the equation (balancing method) until you find the value for the letter.

#### Example

To find the **answer**/value of something

**Use inverse operations** on both sides of the equation (balancing method) until you find the value for the letter.

### Rearranging Formulae (MW – 136 / 190)

**Use inverse operations** on both sides of the formula (balancing method) until you find the expression for the letter.

#### Example

Make  $x$  the subject of  $y = \frac{2x-1}{z}$

Multiply both sides by  $z$

$$yz = 2x - 1$$

Add 1 to both sides

$$yz + 1 = 2x$$

Divide by 2 on both sides

$$\frac{yz + 1}{2} = x$$

We now have  $x$  as the subject.

### Inverse Opposite

#### Example

The inverse of addition is subtraction.

The inverse of multiplication is division.

### Forming Equations / Formulae (MW – 137)

**Substitute letters for words** in the question.

#### Example

Bob charges £3 per window and a £5 call out charge.

$$C = 3N + 5$$

Where  $N$ =number of windows and  $C$ =cost

### Substitution (MW – 95)

**Replace letters with numbers.**

Be careful of  $5x^2$ . You need to square first, then multiply by 5.

#### Example

$a = 3, b = 2$  and  $c = 5$ . Find:

1.  $2a = 2 \times 3 = 6$

2.  $3a - 2b = 3 \times 3 - 2 \times 2 = 5$

3.  $7b^2 - 5 = 7 \times 2^2 - 5 = 23$

### Solving Two Step Equations (MW – 135a)

Finding the value of an unknown, by identifying operations performed and doing the inverse operation:

#### Example

$$\begin{array}{l} 2x + 1 = 9 \\ \xrightarrow{+1} 2x = 8 \\ \xrightarrow{\times 2} x = 4 \end{array}$$

### Solving Equations with unknowns on both sides

Add/subtract the smallest algebraic term from both sides:

#### Example

$$\begin{array}{l} 3a - 4 = 7a + 8 \\ \xrightarrow{-3a} -4 = 4a + 8 \\ \xrightarrow{-8} -12 = 4a \\ \xrightarrow{\div 4} -3 = a \end{array}$$

### Solving Equations involving fractions

#### (MW – 210b)

Finding the value of an unknown. To eliminate a denominator, multiply every term by the denominator:

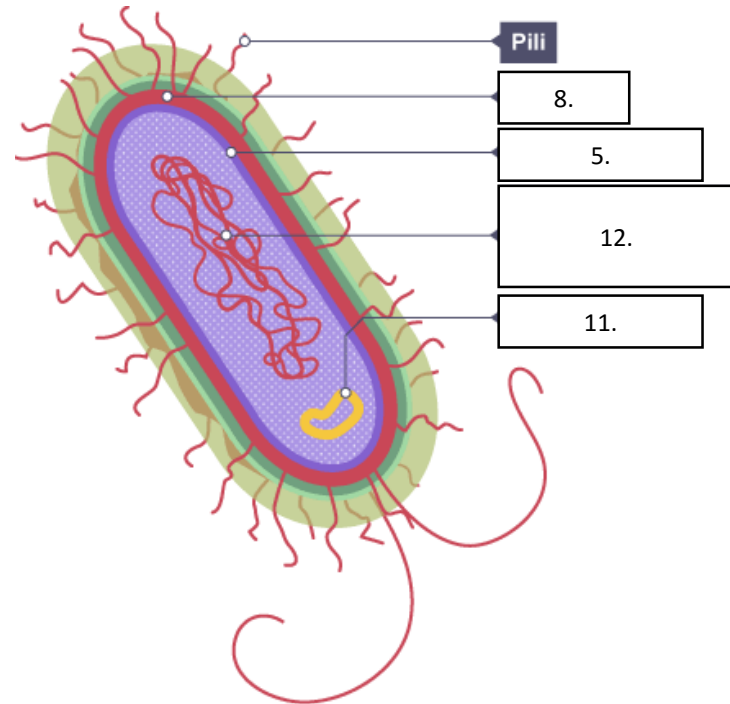
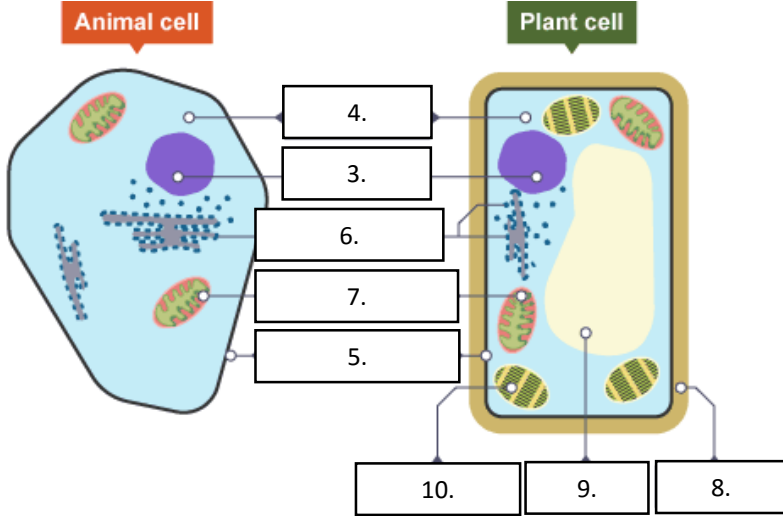
#### Example

$$\begin{array}{l} \frac{x+3}{2} = 4 \\ \xrightarrow{\times 2} x + 3 = 8 \\ \xrightarrow{+3} x = 5 \end{array}$$



# Biology Topic 1: Cell Biology

## 1. Cell structure



Keywords	
<b>1. Eukaryotic</b>	A complex cell with a nucleus (e.g. animal or plant cells).
<b>2. Prokaryotic</b>	A smaller cell without a nucleus (e.g. bacterial cell).
<b>3. Nucleus</b>	Contains genetic material.
<b>4. Cytoplasm</b>	Where a cells chemical reactions happen.
<b>5. Cell membrane</b>	Controls what goes into and out of a cell.
<b>6. Ribosome</b>	Part of a cell where proteins are made.
<b>7. Mitochondria</b>	Where aerobic respiration takes place.
<b>8. Cell wall</b>	Only found in plant cells. Made of cellulose and supports the cell.
<b>9. Vacuole</b>	Only found in plant cells. Contains cell sap.
<b>10. Chloroplasts</b>	Only found in plant cells. Where photosynthesis takes place.
<b>11. Plasmid</b>	Only found in bacterial cells. A small loop of DNA.
<b>12. Genetic material</b>	Long strands of genes not tightly pack in a nucleus.

## 2. Specialised cells

Keywords	
Differentiation	A stem cell turning into a specialised cell
Stem cell	A special type of cell which can turn into other specialised cells
Adult stem cells	Can only produce certain types of cell -found in bone marrow
Embryonic stem cells	Can produce all types of cells - controversial
Meristems	Where plant stem cells are found
Sperm cells	Take male DNA to the egg <ul style="list-style-type: none"> <li>• Tail to help it swim</li> <li>• Lots of mitochondria for energy</li> </ul>
Nerve cells	Carry electrical signals around the body <ul style="list-style-type: none"> <li>• Long to cover long distances</li> <li>• Branches to connect to other cells</li> </ul>
Muscle Cells	Muscle cells contract <ul style="list-style-type: none"> <li>• Long so have space to contract</li> <li>• Lots of mitochondria for energy</li> </ul>
Root hair cells	Root hair cells absorb water and minerals <ul style="list-style-type: none"> <li>• Long hairs</li> <li>• Big surface area for absorption</li> </ul>
Phloem Cells	Phloem cells transport sugars (plants) <ul style="list-style-type: none"> <li>• Long tube joined end to end</li> </ul>
Xylem cells	Xylem cells transport water (plants) <ul style="list-style-type: none"> <li>• Long tubes joined end to end</li> <li>• Hollow so water can flow through</li> </ul>

### 3. Comparing types of microscope

Type of microscope	Advantages	Disadvantages
Light microscope	<ol style="list-style-type: none"> <li>Cheaper</li> <li>Can see colours</li> <li>Can see live specimen</li> </ol>	<ol style="list-style-type: none"> <li>Lower magnification</li> </ol>
Electron microscope	<ol style="list-style-type: none"> <li>Expensive</li> <li>Higher magnification (x1000 more)</li> </ol>	<ol style="list-style-type: none"> <li>Can only see dead specimen</li> <li>No colour</li> </ol>

### 4. Calculating magnification

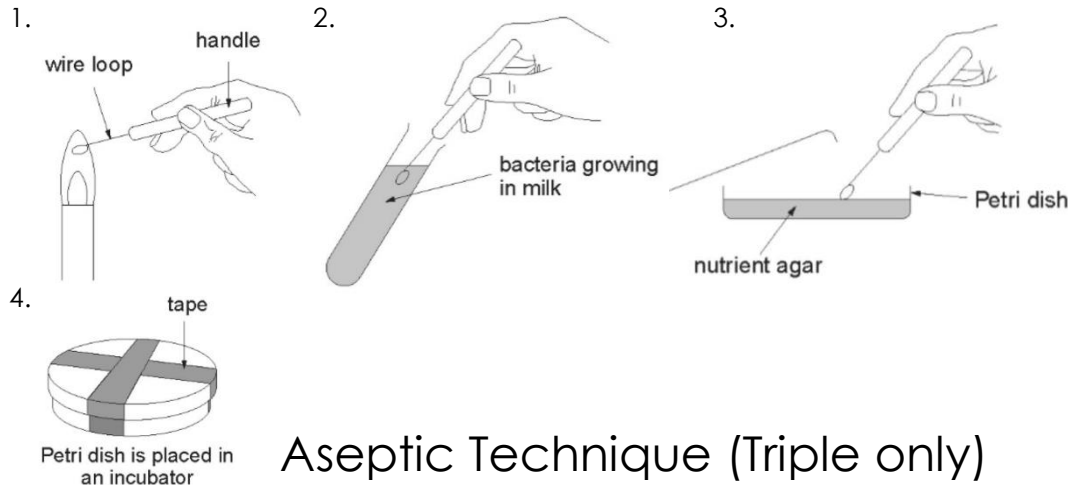
$$\text{magnification} = \frac{\text{size of image}}{\text{actual size of object}}$$

$$\text{actual size of object} = \frac{\text{size of image}}{\text{magnification}}$$



	(mm)	( $\mu\text{m}$ )	(nm)
2mm	2	2000 ( $2 \times 10^3$ )	2000000 ( $2 \times 10^6$ )
130 $\mu\text{m}$	0.13	130	130000 ( $1.3 \times 10^5$ )
0.032m	32	32000 ( $3.2 \times 10^4$ )	32000000 ( $3.2 \times 10^7$ )
7.25 $\mu\text{m}$	0.00725	7.25	7250 ( $7.25 \times 10^3$ )

$\xrightarrow{\times 1000}$        $\xrightarrow{\times 1000}$   
 $\xleftarrow{+ 1000}$        $\xleftarrow{+ 1000}$



### 5. Culturing micro-organisms TRIPLE ONLY

Keywords	
Binary fission	"Splitting in two" how bacteria divide every 20 mins
Agar gel	A gel of nutrients bacteria can grow on
Nutrient broth	A liquid bacteria grow well in
Colony	A group of bacteria making a small circular shape
Inoculating loop	A metal loop use to transfer microorganisms
Petri dish	A small plastic dish used for growing microorganisms
Aseptic	Free from bacteria and viruses
Incubator	Device kept at constant temperature to help the microorganisms grow

Aseptic technique	
prep	All agar plates and broth must be sterilised before use
1.	The inoculating loop must be sterilised by passing through a flame
2.	Sample to be cultured is taken using the loop
3.	Sample spread on agar in petri dish
4.	Dish sealed shut with tape and incubated at 25° C

## 6. Cell division

### Keywords

Chromosomes	Long strands of DNA containing genes. Found in 23 pairs in a human
Cell cycle	The process the cell goes through to divide
Mitosis	A type of cell division that creates 2 identical daughter cells
Therapeutic cloning	Using an embryo create to have the same genes as the patient. Controversial

## 8. Transport in cells

### Keywords

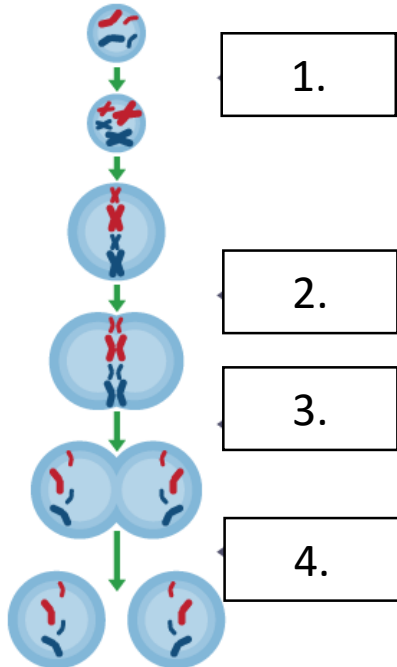
### Definition

### Examples

Diffusion	The passive movement of a substance from an areas of high concentration to an area of low concentration	<ul style="list-style-type: none"> <li>Oxygen and carbon dioxide in the lungs</li> <li>Perfume in a room</li> </ul>
Osmosis	The movement of <b>water</b> molecules across a partially permeable membrane from a less concentrated solution to a more concentrated solution.	<ul style="list-style-type: none"> <li>Water uptake in plants</li> <li>Water absorption in the intestine</li> </ul>
Active transport	Movement of a substance from a lower concentration to a higher concentration, against the concentration gradient. <b>Uses energy.</b>	<ul style="list-style-type: none"> <li>Mineral absorption by roots</li> <li>Glucose absorption by the intestine</li> </ul>
Surface area to volume ratio	The surface area divided by the volume expressed as a ratio	All high <ul style="list-style-type: none"> <li>Unicellular organisms</li> <li>Alveoli in the lungs</li> <li>Villi in the intestines</li> </ul>

## 7. Stages of mitosis

1.	The cell grows and copies all its DNA, mitochondria and ribosomes
2.	The nucleus dissolves and the copied chromosomes pair up
3.	The chromosomes are pulled to opposite sides of the cell
4.	The cytoplasm and cell membrane divides making two identical cells



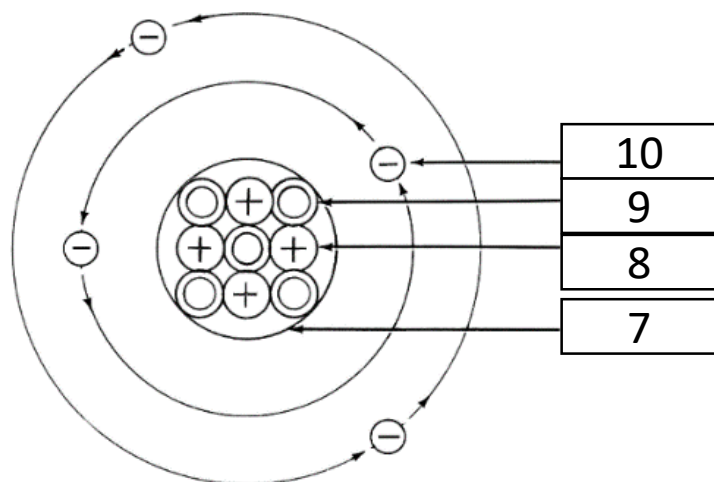
## 9. Factors that effect the rate of diffusion/osmosis

Speed up	Slow down
High concentration gradient	Low concentration gradient
High temperature	Low temperature
High surface area of membrane	Low surface area of membrane

# Chemistry topic 1: Atomic structure

## 1. Keywords

<b>1. Atom</b>	The smallest possible piece of an element. Has a radius of 0.1nm (or $1 \times 10^{-10} \text{m}$ )
<b>2. Element</b>	A substance in which all the atoms have the same atomic number
<b>3. Isotope</b>	Atoms with the same number of protons but different numbers of neutrons
<b>4. Molecule</b>	Two or more atoms bonded together
<b>5. Compound</b>	Two or more <u>different</u> atoms bonded together
<b>6. Mixture</b>	At least two different elements or compounds together. Can be separated easily
<b>7. Nucleus</b>	The centre of an atom. Contains protons and neutrons
<b>8. Proton</b>	A positively charged particle found in the nucleus
<b>9. Neutron</b>	A neutral particle found in the nucleus. Has no charge
<b>10. Electron</b>	A negatively charged particle found in energy levels (shells) around the nucleus



## 2. Properties of sub-atomic particles

Particle	Relative mass	Relative charge	Location
Proton	1	+1	Nucleus
Neutron	1	0	Nucleus
Electron	0	-1	Shells

### Key

relative atomic mass  
**atomic symbol**  
name  
 atomic (proton) number

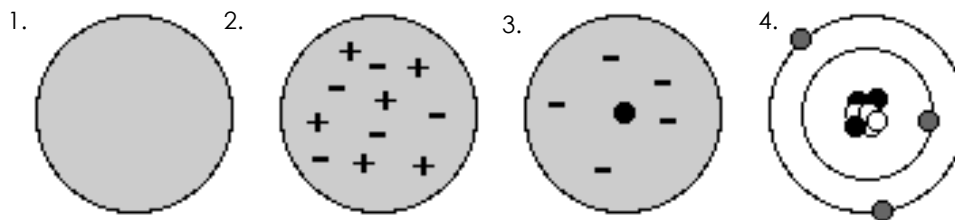
1  
**H**  
 hydrogen  
 1

## 3. Using the periodic table

Number of..	Is the...	Found by..
Protons	Atomic (proton) number	Smaller number on periodic table
Electrons	Atomic (proton) number	Smaller number on periodic table
Neutrons	Difference between the atomic mass and atomic number	Big number - small number

## 4. History of the atom

Discovery	By	Model	Diagram
Solid particle called atom	John Dalton	Particle: solid spheres	1
The electron	JJ Thompson	Plum pudding: positive 'cake' with negative 'plums'	2
Nucleus	Rutherford	Nuclear: Positive nucleus surrounded by electrons	3
Neutron	James Chadwick	Nuclear: Now with protons and neutrons in nucleus	3
Energy levels (shells)	Niels Bohr	Planetary: Electrons now 'orbit' in different shells	4



### 5. Electron arrangement rules

1.	Always fill from the inside to the outside
2.	The first shell can only hold 2 electrons
3.	The second and third can hold 8

### 6. History of the Periodic Table

Invented by	Dmitri <b>Mendeleev</b> , a Russian scientist.
Arranged	In order of <b>atomic mass</b> , and by their <b>chemical properties</b>
What was special about it?	<b>Predicted</b> the existence of <b>other elements</b> not discovered, and <b>left gaps</b> for them in his table
Why was it used?	<b>New elements</b> were <b>discovered</b> that <b>matched these gaps</b>

### 7. Properties – metals and non-metals

Property	Metals	Non-metals
Density	High (they feel heavy for their size)	Low (they feel light for their size)
Strength	Strong	Weak
Malleable or brittle	Malleable (they bend without breaking)	Brittle (they break or shatter when hammered)
Conduction of heat	Good	Poor (they are insulators)
Conduction of electricity	Good	Poor (they are insulators) apart from graphite

### Period No. of shells

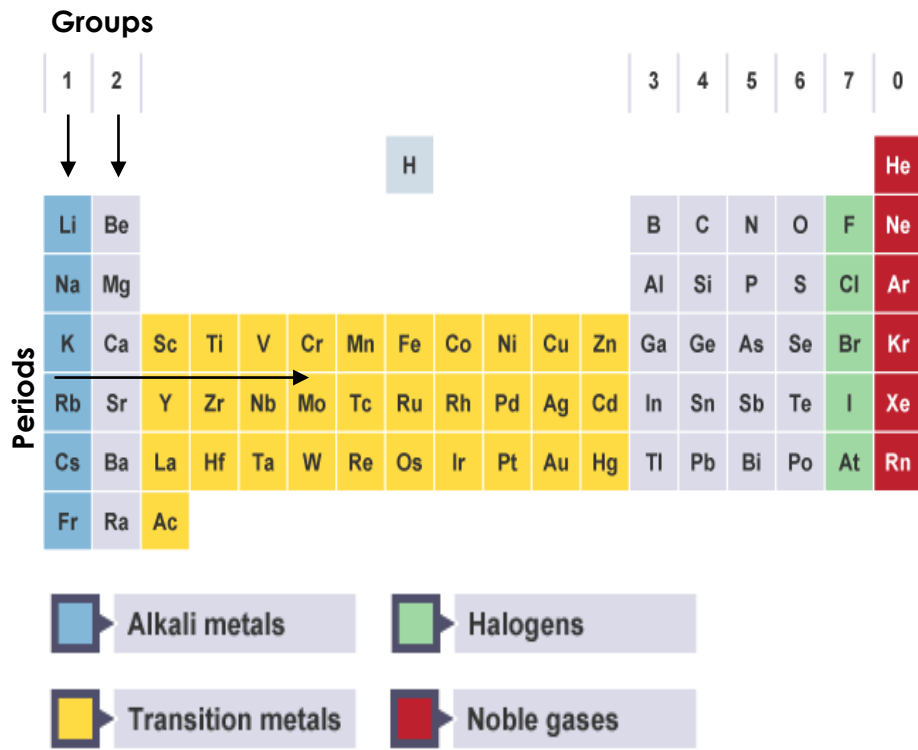
1	1
2	2
3	3
4	4
5	5
6	6
7	7

### TL/DR:

**Group number**  
Tells you're the number of outer electrons

**Period number**  
Tells you how many shells

### 8. Layout of the periodic table



Group	1	2	3	4	5	6	7	8
Electrons in outer shell	1	2	3	4	5	6	7	8
Charge of ion	+1	+2	+3	N/A	-3	-2	-1	N/A
Number of covalent bonds	N/A	N/A	N/A	4	3	2	1	N/A

N/A = not applicable (does not do it)

## 9. Properties – Groups 1 and 7

Group 1 (I)	Melting point	Density	Reactivity	Group 7 (VII)	Melting point	Density	Reactivity	Group 0 (VIII)	Melting point	Density	Reactivity
Lithium (Li)	<b>Decreases</b> down the group	<b>Increases</b> down the group	<b>Increases</b> down the group	Fluorine (F)	<b>Increases</b> down the group	<b>Increases</b> down the group	<b>Decreases</b> down the group	Helium (He)	<b>Increases</b> down the group	<b>Increases</b> down the group	<b>INERT</b>  <b>(DO NOT REACT)</b>
Sodium (Na)				Chlorine (Cl)				Neon (Ne)			
Potassium (K)				Bromine (Br)				Argon (Ar)			
Rubidium (Rb)				Iodine (I)				Xenon (Xe)			

## 10. Transition metals (TRIPLE ONLY)

Properties compared to group 1 elements	Other useful properties
More dense	Ions can have different charges
Harder	Form coloured compounds
Stronger	Good catalysts
Higher melting points	
Less reactive	

## 11. Common separation techniques

### 1. Chromatography

Used to separate a mixture of dyes in ink.

### 2. Filtration

Used to separate insoluble solids from liquids (e.g. sand from water).

### 3. Evaporation

Used to separate a soluble salt from solution. The solution is heated strongly in an evaporating basin until dry crystals are left.

### 4. Crystallisation

Used to separate a soluble salt from solution. The solution is heated gently in an evaporating basin until crystals form; the remaining liquid is filtered out.

### 5. Simple distillation

Is used to separate a liquid from a solution – e.g. water from ink. A condenser is used to cool hot gas until it forms a liquid.

### 6. Fractional distillation

Used to separate a mixture of liquids with different boiling points.

# Physics topic 1: Energy

1. Key Term	Definition
Kinetic energy (KE)	The energy an object has because it is moving
Gravitational potential energy (GPE)	The energy an object has because of its position
Elastic potential energy	The energy stored in a springy object when you stretch or squash it
Thermal energy	The energy a substance has because of its temperature
Chemical energy	The energy stored in fuels, food, and batteries
Conservation of energy	Energy cannot be created or destroyed only transferred.
Work done	The energy transferred by a force
Dissipation	The process of energy being transferred or lost to the surroundings
Friction	A force that opposes movement
System	An object or group of objects
Closed system	An isolated system where no energy transfers take place into or out of the energy stores in the system.
Useful energy	Energy in the place it is wanted in the form that it is needed in
Wasted energy	Energy that is not usefully transferred, usually as thermal.

## 2. Calculating efficiency

- Efficiency =  $\frac{\text{Useful output energy transferred by the device}}{\text{Total input energy supplied to the device}}$
- Efficiency =  $\frac{\text{Useful power out}}{\text{Total power in}}$
- No device can be more than 100% efficient.
- Machines waste energy because of friction between their moving parts, air resistance, electrical resistance, and noise.

## 5. Energy is transferred by:

- Heating
- Waves
- Electric current
- Force when it moves an object.

## 3. Equations to recall and apply

$$\text{Work done, } W = \text{force applied, } F \times \text{distanced moved, } s$$

(joules, J)                      (newtons, N)                      (metres, m)

$$\text{Change in objects gravitational potential energy store, } \Delta E_p = \text{mass, } m \times \text{Gravitational field strength, } g \times \text{Change of height, } \Delta h$$

(joules, J)                      (kilograms, kg)                      (newtons per kilogram, N/kg)                      (metres, m)

$$\text{Elastic potential energy, } E_e = \frac{1}{2} \times \text{spring constant, } k \times \text{extension}^2, e^2$$

(joules, J)                      (newtons per metre, N/m)                      (metres, m)

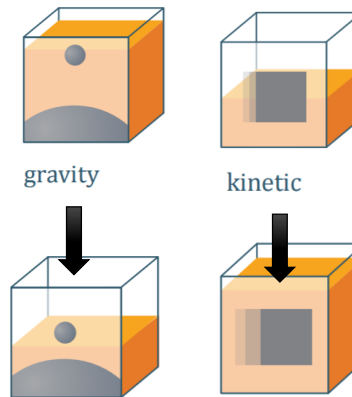
$$\text{Kinetic energy, } E_k = \frac{1}{2} \times \text{mass, } m \times \text{speed}^2, v^2$$

(joules, J)                      (kilograms, kg) (metres per second, m/s )

## 4. Power

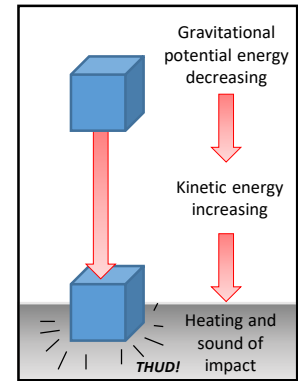
- The more powerful an appliance, the faster the rate at which it transfers energy
- Power, P** =  $\frac{\text{Energy transferred to appliance, } E \text{ (joules, J)}}{\text{Time taken for energy to be transferred, } t \text{ (seconds, s)}}$  (watts, W)
- The power wasted by an appliance = total power input - useful power output

## 6. Conservation of energy in action



### A falling object:

- Decreases its GPE store
- Increases its KE store as it falls
- Waste energy transferred as thermal and sound





## 4. Energy Resources

Energy Resource	Renewable	Advantages	Disadvantages
Fossil Fuels	No	<ul style="list-style-type: none"> <li>• Low cost.</li> <li>• Easily transportable.</li> <li>• Reliable.</li> </ul>	<ul style="list-style-type: none"> <li>• Produces large amounts of Carbon Dioxide.</li> <li>• Produces some Sulfur Dioxide.</li> </ul>
Nuclear	No	<ul style="list-style-type: none"> <li>• Generates a lot of electricity.</li> <li>• Reliable.</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive to construct and run.</li> <li>• Produces dangerous radioactive waste which will last for thousands of years.</li> </ul>
Solar	Yes	<ul style="list-style-type: none"> <li>• No fuel costs.</li> <li>• No pollution.</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive to set up.</li> <li>• Doesn't work at night.</li> </ul>
Wave	Yes	<ul style="list-style-type: none"> <li>• No fuel costs.</li> <li>• Reliable.</li> </ul>	<ul style="list-style-type: none"> <li>• Can damage marine ecosystems.</li> <li>• Not everywhere is near water.</li> </ul>
Tidal	Yes	<ul style="list-style-type: none"> <li>• No fuel costs.</li> <li>• No pollution.</li> <li>• Reliable.</li> </ul>	<ul style="list-style-type: none"> <li>• Can damage marine ecosystems.</li> <li>• Not everywhere is near water.</li> </ul>
Wind	Yes	<ul style="list-style-type: none"> <li>• No fuel costs.</li> <li>• No pollution.</li> </ul>	<ul style="list-style-type: none"> <li>• Not always reliable.</li> <li>• Noisy.</li> <li>• Some think they are ugly (eyesore).</li> </ul>
Geothermal	Yes	<ul style="list-style-type: none"> <li>• No fuel costs.</li> <li>• No pollution.</li> </ul>	<ul style="list-style-type: none"> <li>• Very few areas where it is accessible.</li> </ul>
Biomass	Yes	<ul style="list-style-type: none"> <li>• Low cost.</li> <li>• Readily available.</li> <li>• Carbon neutral.</li> </ul>	<ul style="list-style-type: none"> <li>• Large scale land use requiring lots of water.</li> <li>• Destruction of habitat to grow crops.</li> </ul>
Hydro-electric	Yes	<ul style="list-style-type: none"> <li>• No fuel costs.</li> <li>• Reliable.</li> <li>• Easily controlled.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires flooding land to build</li> </ul>

Carbon neutral: a process by which no extra carbon is released to the atmosphere.

# Level 1/2 Hospitality and Catering: Unit 2-2.1.1 - Nutrition at different life stages & special dietary needs



## Nutrition at different life-stages

### Adults:

- **Early** – Growth in regard to height of the body continues to develop until 21 years of age. Therefore, all micro-nutrients and macro-nutrients especially carbohydrates, protein, fats, vitamins, calcium and iron are needed for strength, to avoid diseases and to maintain being healthy.
- **Middle** – The metabolic rate starts to slow down at this stage, and it is very easy to gain weight if the energy intake is unbalanced and there isn't enough physical activity.
- **Elderly** – The body's systems start to slow down with age and a risk of blood pressure can increase as well as decrease in appetite, vision and long-term memory. Because of this, it is essential to keep the body strong and free from disease by continuing to eat a healthy, balanced diet.

### Children:

- **Babies** – All nutrients are essential and important in babies, especially protein as growth and development of the body is very quick at this stage. Vitamins and minerals are also important. You should try to limit the amount of salt and free sugars in the diet.
- **Toddlers** – All nutrients remain very important in the diet at this stage as growth remains. A variety of foods are needed for toddlers to have all the micro-nutrients and macro-nutrients the body needs to develop.
- **Teenagers** – The body grows at a fast pace at different times at this stage as the body develops from a child to an adult, therefore all nutrients are essential within proportions. Girls start their menstruation which can sometimes lead to anaemia due to not having enough iron in the body.

## Special Dietary needs

### Different energy requirements based on:

- Lifestyles / Occupation / Age / Activity level  
The amount of energy the body needs is determined with each of the above factors e.g. active lifestyle or physical activity level would need more energy compared to a person being sedentary.

### Medical conditions:

- **Allergens** – Examples of food allergies include milk, eggs, nuts and seafood.
- **Lactose intolerance** – Unable to digest lactose which is mainly found in milk and dairy products.
- **Gluten intolerance** – Follows a gluten free diet and eats alternatives to food containing wheat, barley and rye.
- **Diabetes (Type 2)** – High level of glucose in the blood, therefore changes include reducing the amount of fat, salt and sugar in the diet.
- **Cardiovascular disorder** – Needing a balanced, healthy diet with low levels of salt, sugar and fat.
- **Iron deficiency** – Needing to eat more dark green leafy vegetables, fortified cereals and dried fruit.

### Dietary requirements:

- **Religious beliefs** – Different religions have different dietary requirements.
- **Vegetarian** – Avoids eating meats and fish but does eat dairy products and protein alternatives such as quorn and tofu.
- **Vegan** – Avoids all animal foods and products but can eat all plant-based foods and protein alternatives such as tofu and tempeh.
- **Pescatarian** – Follows a vegetarian diet but does eat fish products and seafood.



# Level 1/2 Hospitality and Catering: Unit 2-2.1.1 - Understanding the importance of nutrition



## The importance of nutrition

Listed below are the macro-nutrients and micro-nutrients. You need to know their function in the body and know examples of food items for each. You need to know why they are needed in the diet and why there is a need for a balanced/varied diet.

### Macro-nutrients

**Carbohydrates** - Carbohydrates are mainly used in the body for energy. There are two types of carbohydrates which are:

- **Starch** - Examples include bread, pasta, rice, potatoes and cereals.
- **Sugar** - Examples include sweets, cakes, biscuits & fizzy drinks.

**Fat** - This is needed to insulate the body, for energy, to protect bones and arteries from physical damage and provides fat soluble vitamins. There are two main types of fat which are:

- **Saturated fat** - Examples include butter, lard, meat and cheese.
- **Unsaturated fat** - Examples include avocados, plant oils such as sunflower oil, seeds and oily fish.

**Protein** - Protein is mainly used for growth and repair in the body and cell maintenance. There are two types of protein which are:

- **High biological value (HBV) protein** - Includes meat, fish, poultry, eggs, milk, cheese, yogurt, soya and quinoa.
- **Low biological value (LBV) protein** - Includes cereals, nuts, seeds and pulses.

### Micro-nutrients

#### Vitamins

- **Fat soluble vitamin A** - Main functions include keeping the skin healthy, helps vision in weak light and helps children grow. Examples include leafy vegetables, eggs, oily fish and orange/yellow fruits.
- **Fat soluble vitamin D** - The main function of this micro-nutrient is to help the body absorb calcium during digestion. Examples include eggs, oily fish, fortified cereals and margarine.
- **Water soluble vitamin B group** - Helps absorb minerals in the body, release energy from nutrients and helps to create red blood cells. Examples include wholegrain foods, milk and eggs.
- **Water soluble vitamin C** - Helps absorb iron in the body during digestion, supports the immune system and helps support connective tissue in the body which bind cells in the body together. Examples include citrus fruits, kiwi fruit, cabbage, broccoli, potatoes and liver.

#### Minerals

- **Calcium** - Needed for strengthening teeth and bones. Examples include dairy products, soya and green leafy vegetables.
- **Iron** - To make haemoglobin in red blood cells to carry oxygen around the body. Examples include nuts, beans, red meat and green leafy vegetables.
- **Sodium** - Controls how much water is in the body and helps with the function of nerves and muscles. Examples include salt, processed foods and cured meats.
- **Potassium** - Helps the heart muscle to work correctly and regulates the balance of fluid in the body. Examples include bananas, broccoli, parsnips, beans, nuts and fish.
- **Magnesium** - Helps convert food into energy. Examples include wholemeal bread, nuts and spinach.
- **Dietary fibre (NSP)** - Helps digestion and prevents constipation. Examples include wholegrain foods (wholemeal pasta, bread and cereals), brown rice, lentils, beans and pulses.
- **Water** - Helps control temperature of the body, helps get rid of waste products from the body and prevents dehydration. Foods that contain water naturally include fruits and vegetables, milk and eggs.



# Level 1/2 Hospitality and Catering: Unit 2-2.1.2 - How cooking methods can impact on nutritional value



## Boiling

- Up to 50% of vitamin C is lost when boiling green vegetables in water.
- The vitamin B group is damaged and lost in heat.

## Poaching

- The vitamin B group are damaged in heat and dissolve in water.

## Roasting

- Roasting is a method of cooking in high temperatures and so this will destroy most of the group C vitamins and some of the group B vitamins.

## Frying

- Using fat whilst frying increases the amount of vitamin A the body can absorb from some vegetables
- Cooking in fat will increase the calorie count of food e.g deep fat frying foods.

## Stir-frying

- The small amount of fat used whilst stir-frying increases the amount of vitamin A the body can absorb from some vegetables.
- Some vitamin C and B are lost due to cooking in heat for a short amount of time.

## Steaming

- Steaming is the best cooking method for keeping vitamin C in foods.
- Only up to 15% of vitamin C is lost as the foods do not come into contact with water.

## Grilling

- Using this cooking method can result in losing up to 40% of group B vitamins.
- It is easy to overcook protein due to the high temperature used in grilling foods.

## Baking

- Due to high temperatures in the oven, it is easy to overcook protein and damage the vitamin C and B group vitamins.





### Sustainability

Many diners are interested in hospitality and catering provisions that provide sustainable dining.

The aim of the three Rs of sustainability is to conserve natural resources and prevent excess waste. By following the rules of reduce, reuse, and recycle, hospitality and catering provisions can save money at the same time as attracting more diners and bringing in more profit.

Sustainability also means buying local produce, using organic ingredients, buying meat and poultry from farm assured producers who guarantee better welfare for the animals, using Marine Stewardship Council sustainable fish and offering meat-free versions of favourite dishes.

### Reduce

**Food waste:** If food and waste were its own country, it would be the third largest producer of greenhouse gas in the world! If it cannot be used to make new dishes or given away, then as much food waste as possible should be composted.

**Energy use:** Hospitality and catering provisions can save energy in many ways including using low-energy lighting, maintaining and upgrading equipment, putting lids on saucepans, batch baking and cooking.

**Food miles:** Using local suppliers means that the food does not have to travel as far from 'field to fork'.

**Water usage:** Use less in cooking by only just submerging vegetables or using a steamer. Use an energy and water efficient dishwasher.

### Reuse

Food that is past its best, for example a brown banana, or scraps such as bones can be used to create new dishes which in turn will decrease food waste. [www.lovefoodhatewaste.com](http://www.lovefoodhatewaste.com) has a vast range of recipe ideas for using surplus food.

- Bread: breadcrumbs, bread and butter pudding, bread sauce and croutons.
- Meat and poultry: bones can be used to make stocks.
- Fruit: banana muffins, apple crumble, fruit coulis, smoothies.
- Vegetables: bubble and squeak, vegetable stock, vegetable bakes, omelettes.
- Eggs: whites can be used to make meringue; yolks can be used to make mayonnaise.

### Recycle

Many hospitality and catering provisions have separate bins for recyclable materials. Professional kitchens should also have areas to separate waste into recyclable, non-recyclable and compostable materials. All staff should be trained to know how to dispose waste correctly.

Coffee grounds can be composted. Compost can be used to grow fruit, vegetables and herbs for use in the kitchen.

Jars and plastic containers can be used for storage in the kitchen. Glass bottles can be used to hold flowers or candles as table decorations.

*Too Good To Go*, *Karma* and *Olio* are apps used by restaurants and supermarkets. Customers can buy discounted food which would otherwise go into landfill.



You need to be able to plan dishes for a menu as well as know, understand and include the following:

### Commodity list with quantities

This means naming all the ingredients needed to make all dishes and how much of each one e.g. grams (g), ounces (oz), millilitres (ml), etc.

### Contingencies

This means stating, in the plan, what you would do to deal with a problem if something were to go wrong.

### Equipment list

Naming all pieces of equipment you would need to cook the dishes, which also includes specialist equipment such as pasta machines and ice cream makers as well as saucepans, chopping boards, knives, etc.

### Health, safety and hygiene

Stating in the plan, points regarding the health, safety and hygiene. The use of temperature probes to ensure foods are cooked, correctly using colour coded chopping boards or washing hands after handling raw meat are a few examples.

### Quality points

These include naming any quality points to consider in the preparation, cooking and serving stage of the plan. Examples could include checking foods are in use by/best before dates, dishes are cooked to minimum temperatures, ingredients stored in correct places and correct temperature, etc.

### Sequencing or dovetailing

This means you fit together the different steps and activities in logical order when planning to cook more than one dish.

### Timing

You need to state realistic timings of how long each step is likely to take throughout your plan to give accurate information of how long your dishes take to complete.

### Mise en place

This is all the preparation you undertake before cooking. Examples of this include weighing out ingredients, collecting equipment and washing hands.

### Cooking

Throughout your plan, you will need to state how you ensure food is cooked correctly, e.g. chicken is white in the middle, using a temperature probe, etc.

### Cooling and hot holding

Cooling dishes correctly within 1.5hrs to 8 degrees and keeping hot dishes for service at 63 degrees should be mentioned in your plan for relevant dishes, as well as how you would ensure these temperatures are met, e.g. by using temperature probes.

### Serving

Once you have finished cooking your dish or dishes, you need to state how you would present your dish/dishes, e.g. on plate, bowl, etc., as well as what decoration, garnishes and sauces you include before serving.

### Storage

In your plan, you should state where different kinds of ingredients need to be stored, e.g. raw chicken in the fridge or frozen fruit in the freezer and at what temperatures these pieces of equipment need to be (fridge needs to be 0–5 degrees and freezer needs to be -18 degrees).





## Creativity

It is said that 'we eat with our eyes'. Creativity in plating dishes enhances the diner's experience – diners want to be 'wowed' when their meal appears!

**Serving dishes:** Start with the plate – varied sizes, shapes and colours can add immediate impact to your dish. Dishes served in bowls or dessert glasses should be placed on a plate to aid serving.

**Elements:** Each dish will consist of several elements – the main protein, accompaniments, garnish and decoration.

**Volume:** Do not overcrowd the plate – leave some space so that the diner can see each element of the dish. The rule of thumb is that only two-thirds of the plate should be full.

**Height:** Food can be stacked to add height to the overall dish, but each element should be visible.

**Colour:** Accompaniments, garnishes and decoration can add colour to dishes where the main elements are similar in colour. An example is fish and chips: bright green peas and a slice of yellow lemon will enhance the overall appearance of the meal.

**Functionality:** The dish should be beautiful to look at, but easy for the diner to eat.

**Temperature:** Hot food should be served on hot plates. Cold food should be served on chilled plates.

## Accompaniments

Accompaniments should be chosen to complement the main part of the dish. Examples include:

### Carbohydrate accompaniments:

- Savoury: bread, dauphinoise potatoes, pilau rice.
- Sweet: shortbread, brandy snaps, macaron.

### Fruit and vegetable accompaniments:

- Savoury: pea purée, roasted root vegetables, griddled asparagus.
- Sweet: berry compote, fruit kebabs, grilled peaches.

### Sauces:

- Savoury: gravy, red wine jus, parsley sauce.
- Sweet: custard, salted caramel sauce, chocolate sauce.

## Portion control

It is important that the customer is satisfied with their portion without the plate being overcrowded. Keeping portion control accurate allows hospitality and catering provisions to order adequate supplies of ingredients. Accurate portion control will also help prevent food waste.

## Garnish

Garnishes are additions to a dish which both add to the overall taste and enhance the overall appearance.

**Savoury:** parmesan crisps, crispy onions, caviar, watercress, lemon wedges, fresh herbs, salsa, edible flowers.

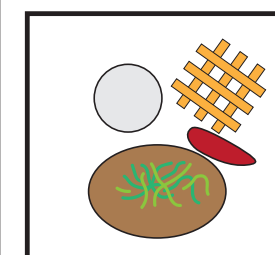
**Sweet:** chocolate dipped strawberries, tuile biscuits, chopped nuts, tempered chocolate work, spun sugar work, edible flowers.

## Decoration

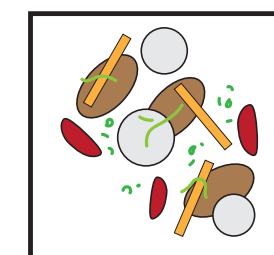
Decoration adds drama to the finished dish but it is not meant to be eaten or add to the overall flavour of the dish. Examples include:

- whole spices added to pilau rice
- gold leaf
- hollow eggshell as serving dish.

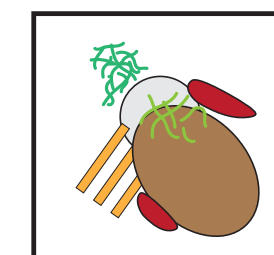
## Plating styles



Classic



Freeform



Landscape





## Food safety practices

During your practical session, you must demonstrate that you can work safely and hygienically. Your plan should show that you have thought about food safety and hygiene during all parts of your practical session. Your personal safety and hygiene practices will be observed during your practical session.

### Personal safety and hygiene practices

#### Hands:

- Wash before, during and after preparing food especially after touching raw meat, dirty vegetables and fridge handles.
- Wash after going to the toilet.
- Wash after sneezing or blowing your nose.
- Wash after disposing of waste.

#### Clothing and hair:

- Clean apron and/or chef's whites.
- Non-slip closed-toe shoes.
- Tie hair back.
- Wear a bandana or hair net.

#### Cuts:

- Cover with a blue, waterproof plaster.

#### Equipment:

- Handle knives safely.
- Use oven gloves when carrying hot items.
- Keep electrical equipment away from water.
- Clean spills immediately.

### Food safety and hygiene practices

#### Ingredients:

- Check use-by and best before dates.
- Check ingredients for freshness; no bruises on fruit, fish should not smell.
- Store correctly until needed.

#### Cleaning:

- Clean worktops before preparation.
- Clean workstation and equipment after preparing high-risk foods.
- Wash up throughout the session – do not leave it all until the end!

#### Temperatures:

- Keep high-risk foods in the fridge (0°C – 5°C) until needed.
- Use a temperature probe to check core temperature of high-risk foods.

#### Waste management:

- Keep waste separate from ingredients during preparation, cooking and serving.
- Recycle and compost waste if possible.

### Management of accidents

- Ensure that you know the location of the First Aid box.
- Ensure that you know how to use a fire blanket or fire extinguisher.





## Dish production

- Were you able to keep to your time plan?
- Did you have any problems during the practical? How did you resolve them?

## Dish selection

- Did your dishes contain the right nutrients for your two groups?
- Were they expensive or cheap to produce?
- Did they contain seasonal or local produce?

## Organoleptic

How did your dishes:

- Look (appearance)?
- Taste (flavour and texture)?
- Smell (aroma)?

## Hygiene

- Did you follow all hygiene guidelines?
- Did you wear correct PPE?
- Did you wash up between jobs?

## Reviewing of dishes

### PEE: Point, Evidence, Explain

You need to write a self-reflection of how you performed during your practical session. There are 8 areas to consider when you write your review of your dishes.

## Presentation

- Were the portions the right size for your two groups?
- How did you add colour to your dishes?
- Were your garnishes and decorations appropriate?

## Health and safety

- Were you able to use equipment safely?
- Did you store ingredients correctly?

## Waste

- Did you separate your waste into categories? (Food waste, recyclable materials, general waste.)
- Did you buy the right amount of ingredients?

## Improvements

- If you made your dishes again, what would you do differently?
- If you had to do the task again, would you change your choice of dishes?
- Would you add additional accompaniments?





### Decision making

- What were your strengths in completing the written tasks?
- What were your strengths in choosing dishes?
- How could you improve weak decisions?
- Were the dishes easy to make together?
- What were the disadvantages of the chosen dishes?
- Did your dishes meet the needs of the provision?
- Did your dishes meet the needs of your two groups (nutrition and cost)?

### Planning

Was the practical session plan in a logical order?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

Were you able to keep to the plan during the practical session?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

### Organisation

How did you organise your written tasks?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

How did you organise your workstation during the practical session?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

### Time management

How did you manage your time when completing the written tasks?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

How did you manage your time during the practical session?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.





### Factors affecting menu planning

You need to be aware of the following factors when planning menus:

- **cost** (ingredients as well as business costs)
- **portion control** (value for money without waste)
- **balanced diets/current national advice**
- **time of day** (breakfast, lunch, and dinner menus as well as small plates and snacks)
- **clients/customers** (a menu with prices that will suit the people who visit your establishment).

### Equipment available

You need to know and understand the type of equipment needed to produce a menu. The choice of dishes will be influenced by the equipment available to the chef.

This includes kitchen equipment such as:

- hobs, ovens, and microwaves
- fridge, freezer and/or blast chiller
- specialist equipment, for example a *sous vide* or pizza oven
- hand-held equipment, for example electric whisks or hand-blenders
- other electric equipment, for example food processors.

### Skills of the chef

The skills of the chef must be suited to the type of provision and the menu offered.

A Michelin starred restaurant will require a chef who has complex skills in preparation, cooking and presentation of dishes.

A café will require a chef who has a range of medium and complex skills to produce a suitable menu.

A large restaurant will normally have a full kitchen brigade while a smaller establishment may only have a single chef with one or two assistants.

### Time available

The type of provision will influence the amount of time a customer may be willing to wait for their dish to be prepared. Can the chef prepare, cook, and present more than one dish at the same time? Can some items be made in advance?

### Time of year

The time of year can affect menu choices. Light and cold dishes such as salads are better suited to the summer months. Hearty dishes such as stews are more suited to the winter. Special dishes linked to holidays such as Christmas and Valentine's Day may also be included. The availability of **seasonal** produce can also affect menu choices as certain commodities, for example strawberries, are less expensive when in season.

### Environmental issues

The chef will need to think about environmental issues when planning a menu. Can the chef **reduce** the amount of ingredients bought as well as reducing food waste? Can the chef **reuse** ingredients to create new dishes for example stale bread made into bread-and-butter pudding? Can the kitchen **recycle** waste wherever possible? Running the kitchen sustainably will save money.

### Organoleptic properties

Organoleptic properties are the sensory features of a dish (**appearance, aroma, flavour, and texture**).

The chef will need to think about how the dish will look and taste. Is there a range of colours? Do the flavours go well together? Are there a variety of textures?





### Skills and techniques

You need to be able to identify the different types of skills you need to produce your selected dishes. Some dishes will require the use of more complex skills. You will need to demonstrate a range of skills when producing your chosen dishes.

Preparation and cooking skills are categorised as follows: **basic**, **medium**, and **complex**.

### Presentation

You should know and understand the importance of using the following appropriate presentation techniques during the production of dishes:

- creativity
- garnish and decoration
- portion control
- accompaniments.

### Basic preparation skills and techniques

Blending, beating, chopping, grating, hydrating, juicing, marinading, mashing, melting, peeling, proving, sieving, tenderising, trimming, and zesting.

### Medium preparation skills and techniques

*Baton*, *chiffonade*, creaming, dehydrating, deseeding, dicing, folding, kneading, measuring, mixing, puréeing, rub-in, rolling, skinning, slicing, spatchcocking, toasting (nuts/seeds) and weighing.

### Complex preparation skills and techniques

*Brunoise*, crimping, de-boning, filleting, *julienne*, laminating (pastry), melting using *bain-marie*, mincing, piping, and segmenting, shaping, unmoulding and whisking (aeration).

### Basic cooking skills and techniques

Basting, boiling, chilling, cooling, dehydrating, freezing, grilling, skimming, and toasting.

### Medium cooking skills and techniques

Baking, blanching, braising, deglazing, frying, griddling, pickling, reduction, roasting, sautéing, steaming, stir-frying, and using a *sous vide* (water bath).

### Complex cooking skills and techniques

Baking blind, caramelising, deep fat frying, emulsifying, poaching, and tempering.



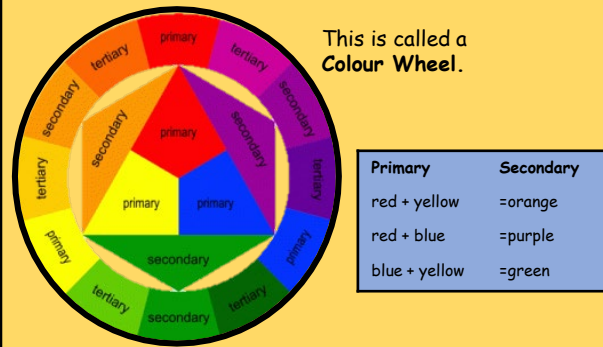
# Year 10 ART Knowledge Organiser

## Year 10 GCSE- Formal Elements

### A. Key Terms

<b>Formal Elements</b>	The parts used to make a piece of artwork.
<b>Line</b>	Line is the path left by a moving point. For example, a pencil or a brush dipped in paint. A line can be horizontal, diagonal or curved and can also change length.
<b>Shape</b>	A shape is an area enclosed by a line. It could be just an outline or it could be shaded in. Shapes can be <b>geometric</b> or <b>irregular</b> .
<b>Form</b>	Form is a <b>three dimensional shape</b> , such as a cube, sphere or cone. Sculpture and 3D design are about creating forms.
<b>Tone</b>	This refers to the lightness or darkness of something. This could be a shade or how dark or light a colour appears. Tones are created by the way light falls on a 3D object. The parts of the object on which the light is strongest are called <b>highlights</b> and the darker areas are called <b>shadows</b> .
<b>Texture</b>	This is to do with the <b>surface quality</b> of something, the way something feels or looks like it feels. There are two types of texture: <b>Actual texture</b> really exists, so you can feel it or touch it; <b>Visual texture</b> is created using marks to represent actual texture.
<b>Pattern</b>	A design that is created by repeating lines, shapes, tones or colours. The design used to create a pattern is often referred to as a <b>motif</b> . Motifs can be simple shapes or complex arrangements.
<b>Colour</b>	Red, yellow and blue are <b>primary colours</b> , which means they can't be mixed using any other colours. In theory, all other colours can be mixed from these three colours.

### B. Colour Theory



Primary	Secondary
red + yellow	=orange
red + blue	=purple
blue + yellow	=green

- **Tertiary colours** are created by mixing a primary colour and the secondary colour next to it on the colour wheel.
- Colours that are next to each other on the colour wheel are called **harmonious**.
- **Complementary colours** are colours that are **opposite** each other on the colour wheel. When complementary colours are used together they create **contrast**. Adding a colour's complimentary colour will usually make a darker shade. This is often preferable to adding black.
- Warm colours are colours on the red side of the wheel. These are red and include orange, yellow and browns.
- Cool colours are colours on the blue side of the wheel. These are blue and include green, purple and most greys.



**G. Wider Thinking**  
 Youtube - How to Shade Basic Forms  
[www.artcyclopedia.com](http://www.artcyclopedia.com)

### C. Composition

The term composition means 'putting together,' and can apply to any work of art or photography, that is arranged or put together using conscious thought. There are numerous approaches or "compositional techniques" to achieving a sense of unity within an artwork, depending on the goals of the artist.

For example, a work of art is said to be aesthetically pleasing to the eye if the elements within the work are arranged in a balanced compositional way. However, there are artists such as Salvador Dali whose sole aim is to disrupt traditional composition and challenge the viewer to rethink balance and design elements within art works.

#### Rule of thirds

The rule of thirds is a guideline followed by some visual artists. The objective is to stop the subject and areas of interest from bisecting the image, by placing them near one of the lines that would divide the image into three equal columns and rows, ideally near the intersection of those lines.



Painting: Great Wave off Kanagawa, by Hokusai

### F. Expert modelling example

When blending colour with tone layer at least two colours.

Use a light line when sketching.

Use the 'flick' technique to blend smoothly between different tones.

### D. Stretch and Challenge

- Keep it light until it's right - don't press down hard when drawing.
- What formal elements can you see in the painting by Hokusai?

### E. Existing similar examples



What formal elements can you see in these works?





## What are natural forms?

Natural forms are objects in nature in their original form.

### Examples:

- Leaves
- Flowers
- Pine cones
- Seaweed
- Shells
- Bones
- Insects
- Stones
- Fossils
- Crystals
- Feathers
- Birds
- Fish
- Animals

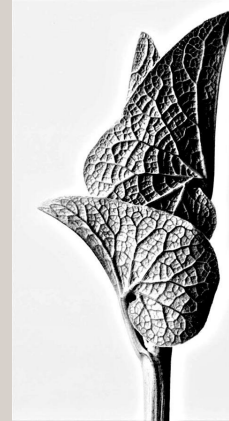
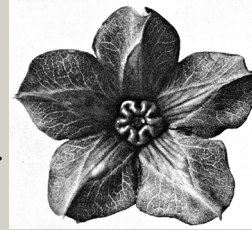
It is, in fact, anything you can find in nature – either complete or a part of it.



## Karl Blossfeldt (1865 - 1932)

Karl Blossfeldt was a German photographer best known for his striking close-up portraits of plants, twigs, seeds, leaves, and other flora. He was inspired by nature and the different ways that plants grow. He believed that "the plant must be valued as a totally artistic and architectural structure".

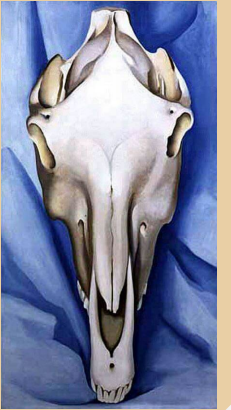
He was transfixed by the repetitive patterns created in the natural world, and in the early 1900's, he began documenting the structure and detail of plants, magnifying them up to 30 times their size using a home-made camera.



## Georgia O'Keeffe (1887 - 1986)

Georgia O'Keeffe was an American painter who was best known for her large-format paintings of natural forms, especially flowers and bones. She once said "I decided that if I could paint that flower in a huge scale, you could not ignore its beauty".

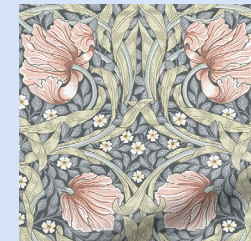
She painted nature in a way that showed how it made her feel. Her unique and new way of painting nature, simplifying its shapes and forms meant that she was considered a pioneer.



## William Morris (1834 - 1896)

William Morris was an English designer and craftsman, whose designs for furniture, fabrics, stained glass, wallpaper, and other decorative arts created the Arts and Crafts movement in England and revolutionized Victorian taste.

Morris took a new approach in the way he used natural forms in his designs. He understood plants intimately but never copied them literally. He said "It is impossible to imitate nature literally; the utmost realism of the most realistic painter falls a long way short of it". He believed that patterns should have 'beauty, imagination and order,' using these principles across all his work.





# Year 10 ART HT1 & HT2 Knowledge Organiser

## Lino Printing

Lino Printing is a form of block printing that involves carving a pattern or design into a linoleum, rubber or vinyl surface that can then be printed from.

The traditional block printing surface is wood, however lino gained popularity in the early 20<sup>th</sup> Century due to it being a cheaper alternative.

It is achieved by carving out a design in the lino. The recesses created by the carving leave the design in relief, and it is the raised design that the ink is applied to. When the block is pressed onto paper, the ink is transferred from the lino to the paper, leaving the design behind.



## Photo Exposure

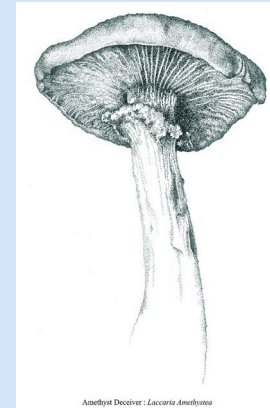
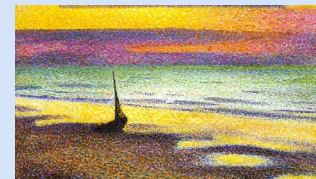
Double exposure photography is a technique that layers two different exposures on a single image, combining two photographs into one. Double exposure creates a surreal feeling for your photos and the two photographs can work together to convey deep meaning or symbolism. A similar technique, called a "multiple exposure," is when you combine more than two exposures in a single image.



## Pointillism

Pointillism is the practice of applying small strokes or dots of colour to a surface so that from a distance they visually blend together. The technique is associated with its inventor, Georges Seurat who founded Neo-Impressionism, a movement that flourished from the late 1880s to the first decade of the 20th century.

Pointillism can also be created using one colour, such as black. To create a successful piece of work using one colour and small dots, you must vary the pressure of the dots, and consider where you place each one. For example, lots of dots close together will appear darker than when spaced far apart.

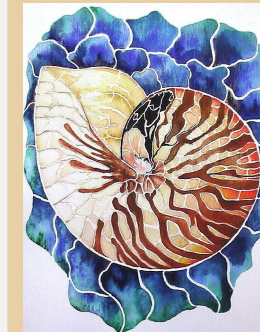


Anethysi Deceivri : Laccaria Anethysina

## Silk painting

Silk painting is an ancient technique that first originated in India and Eastern Asia. Many Asian countries have their own unique silk painting techniques, including Japan, China, Vietnam, and Tibet, with practices that have been passed down and perfected throughout many generations of artists.

The 'Serti' technique is where designs are outlined with gutta or water-based resists, which are applied to white silk that has been pre-washed, dried and stretched (on a stretcher). Once the gutta or water-based resist has dried, it acts as a barrier for the dye or paint; keeping the colour within the outlined areas of the design and allowing you to achieve sharply defined borders.



# Year 10 History Term 1 Knowledge Organiser: The 18<sup>th</sup> & 19<sup>th</sup> Century

## Key Events

<b>1798</b> – Edward <b>Jenner</b> published his method of vaccinating against smallpox.
<b>1847</b> – James <b>Simpson</b> discovered effects of chloroform.
<b>1854</b> – John <b>Snow</b> discovered cholera in the Broad Street Pump.
<b>1859</b> – Florence <b>Nightingale</b> published <i>Notes on Nursing</i>
<b>1861</b> – Louis <b>Pasteur</b> published his Germ Theory
<b>1866</b> – Joseph <b>Lister</b> used carbolic acid spray in surgery
<b>1875</b> – The <b>Public Health Act</b> , forcing councils to provide clean water and sewers.
<b>1882</b> – Robert <b>Koch</b> discovered the bacteria causing tuberculosis.

## Key Words

<b>Smallpox</b>	a dangerous disease causing fever & blisters on the skin.
<b>Immunity</b>	when the body protects itself from an illness by producing antibodies.
<b>Vaccine</b>	injection into the body of a weakened organism to give the body immunity against disease
<b>Cholera</b>	a dangerous disease caused by bacteria in water, that causes dangerous diarrhoea and dehydration.
<b>Epidemic</b>	a widespread outbreak of a disease
<b>Epidemiology</b>	the branch of medicine which tries to understand the distribution, causes and ways to control outbreaks of disease
<b>Spontaneous Generation</b>	the idea that microbes seen under a microscope are the result or consequence of decay and disease.
<b>Germ Theory</b>	the idea that microbes (germs) seen under a microscope are the cause of decay and disease.
<b>Tuberculosis</b>	a lung disease spread through breathing in bacteria from an infected person. (TB)
<b>Public Health</b>	the health of the population and preventing disease & promoting health through government action.
<b>Anaesthetic</b>	drugs given to make someone unconscious of relieve pain during surgery.
<b>Nitrous Oxide</b>	a gas used as an anaesthetic from 1844. (laughing gas)
<b>Ether</b>	a flammable gas used as an anaesthetic from 1846.
<b>Chloroform</b>	a gas used as an anaesthetic from 1847.
<b>Antiseptic</b>	chemicals used to kill germs – for example, carbolic acid.

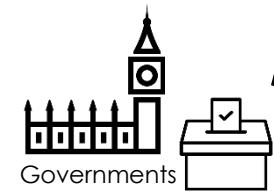
Determined individuals made new discoveries.



New technology and science made discoveries possible



Why was there so much change in the 18<sup>th</sup> & 19<sup>th</sup> Century?



Governments started to make Public Health laws.



Improved transport and communication meant ideas spread quickly.

c1250–c1500:  
Medicine in medieval England

c1500–c1700: The Medical Renaissance in England

c1700–c1900:  
Medicine in 18<sup>th</sup> and 19<sup>th</sup> century Britain

c1900–present:  
Medicine in modern Britain

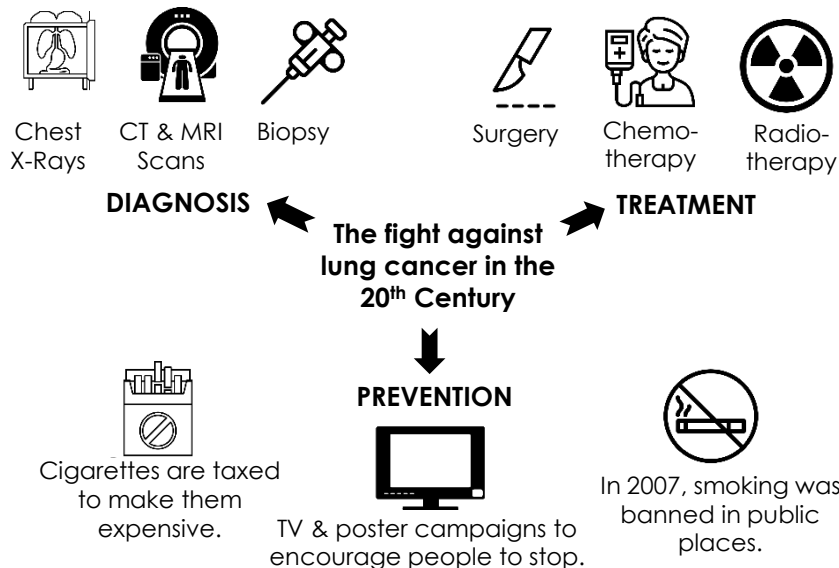
# Year 10 History Term 2 Knowledge Organiser: Modern Britain

## Key Events & People

1895 – Wilhelm Rontgen discovered Xrays
1909 – Paul Ehrlich & Sahachiro Hata – discovered Salvarson 606.
1928 – Alexander Fleming - first wrote about Penicillin.
1932 – Gerhard Domagk - discovered Prontosil.
1942 – William Beveridge – report linked poor health to poverty and recommend government action.
1943 – Florey & Chain – mass production of Penicillin
1948 – The National Health Service set up.
1953 – Franklin, Wilkins, Crick & Watson discovered DNA
1986 – Human Genome Project

## Key Words

<b>X Ray</b>	Technology using particular wave lengths to show bones or other details inside the body.
<b>Magic bullet</b>	A chemical that kills a bacteria but leaves the body unharmed.
<b>Antibiotic</b>	A drug that kills bacteria. E.g. Penicillin.
<b>Penicillin</b>	A type of antibiotic.
<b>Genes</b>	Genes carry the information that determines the characteristics that are passed to you from your parents.
<b>DNA</b>	Deoxyribonucleic acid, the molecule that genes are made of.
<b>Cancer</b>	A disease where cells divide and spread into the surrounding tissue.
<b>Septicaemia</b>	A serious infection in the blood.
<b>Syphilis</b>	A sexually transmitted infection.
<b>Electron microscope</b>	A powerful microscope that allows doctors to see cells in fine detail.
<b>Blood transfusion</b>	An injection of blood, from a healthy person, into a patient.
<b>Transplant surgery</b>	When a faulty or damaged organ (e.g. liver) is swapped with a healthy one through surgery
<b>Keyhole surgery</b>	Surgery carried out through a small cut into the body.
<b>Chemotherapy</b>	Cancer treatment where chemicals are used to kill cells.
<b>Radiotherapy</b>	Cancer treatment where radiation is used to kill cells
<b>NHS</b>	National Health Service – provides free healthcare.



c1250–c1500:  
Medicine in  
medieval England

c1500–c1700: The  
Medical Renaissance  
in England

c1700–c1900:  
Medicine in 18<sup>th</sup> and  
19<sup>th</sup> century Britain

c1900–present:  
Medicine in modern  
Britain



# Year 10 HT1 Drama Knowledge Organiser

## Summary of topic

They must understand the GCSE requirements of the devising plays unit and understand what constitutes successful devised work

## Aims of the topic

To use given stimuli to create and develop a devised piece of theatre

### Devising Rules

- Every actor should have a monologue that is at least 90 seconds long and everyone should have an equal part.
- Divide the work up evenly – script writing (everyone write/plan their own scene), sourcing costume, planning technical theatre (staging, music, lights)
- Help each other out – but only when your own work is done. Even though this is a group project, you still get marked individually.
- Find an idea that every person is happy with and don't rule anything out.
- Try to get it on its feet early – the best ideas come from when you try to act something out, not sit there discussing it.

## **Devising Plays Knowledge Organiser Y10 GCSE**

### Assessment & Rehearsal Tips

- **You will be offered 4 pieces of stimuli given to us by the exam board. 1 song, 1 quote, 1 phrase and 1 picture.**
- **In your given groups, you will generate ideas for each stimuli**
- **You will then decide on a stimuli and an idea. Then you will decide on a practitioner to use for your idea**
- **In your groups you will create a piece of drama around your idea, linked to the stimuli and using practitioner techniques**
- **Try everything – even if something doesn't work, you may discover something useful.**

*'It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair.'*

Charles Dickens, A Tale of Two Cities  
2. 'Best Day of my Life' – American Authors  
3. 'We realise the importance of our voices only when we are silenced' – Malala Yousafzai  
4.  
<https://images.app.goo.gl/Kxp2XA2HGPooKVP H7>



## Skills & Definitions

**Ensemble** – Collaborated group performance.

**Characterisation** – The creating, development and performance of a created character.

**Improvisation** – Spontaneous acting and suggestions that further develop a performance.

**Devised** – Original created performance material, often using a stimulus.

**Stimuli** – The starting point set by exam board e.g. picture, quote, word or song. You chose one.

**Practitioner** – Brecht or Artaud and how they influenced the performance.

**Brecht** – Famous for Political and Epic Theatre. (See practitioner knowledge organiser). Made the audience think and bring real change.

**Artaud** – Famous for Theatre of Cruelty (See practitioner knowledge organiser). Made the audience feel uncomfortable.

**Genre** – Physical theatre is NOT a practitioner, it is a STYLE of drama focused upon storytelling using movement.

**Techniques** – The key skills which are relevant to the practitioner or genre (see practitioner knowledge organiser).

**Final performance** – The end performance of the piece.

**Rehearsal** – The process of creating and developing your piece of theatre

**Monologue** – A one person speech in character. Often around 2 minutes in length.

# Year 10 HT2 Drama Knowledge Organiser

## Summary of topic

Through theory sessions and controlled conditions students will complete their timed evaluation of 90 mins (3 x 30 minutes).

## Aims of the topic

To understand how to write a well structured and analytical evaluation.

## Devising Plays Knowledge Organiser Evaluation Y10 GCSE

## Skills & Definitions

**Analysis** – Describing and saying why.

**Evaluation** – A summary sentence(s) at the end of the section. PEE (point, evidence, explain).

**Structure** – The evaluation is written in 3 main sections – introduction (name of play, stimuli and practitioner/genre, Section 1 Analysis of character portrayal, Section 2 Analysis of own performance skills (practitioner/genre), effectiveness of final performance linking back to stimuli and intentions and final evaluation.

**Stimuli** – The starting point set by exam board e.g. picture, quote, word or song. You chose one.

**Practitioner** – Brecht or Artaud and how they influenced the performance.

**Brecht** – Famous for Political and Epic Theatre. (See practitioner knowledge organiser). Made the audience think and bring real change.

**Artaud** – Famous for Theatre of Cruelty (See practitioner knowledge organiser). Made the audience feel uncomfortable.

**Genre** – Physical theatre is NOT a practitioner, it is a STYLE of drama focused upon storytelling using movement.

**Techniques** – The key skills which are relevant to the practitioner or genre (see practitioner knowledge organiser).

**Effectiveness** – How successful was the final performance?

**Final performance** – The end performance of the piece.

**Word count** – There is NO word count but there is a time limit of 30 mins per section.

**Bullet points** – You are allowed 2 pages of bullet point notes for this assessment.

## Assessment & Performance Tips

Students will complete their final evaluation of the devised performance.

The evaluation should have a title 'Component 1 Devising Evaluation'

It should have 3 main sections. One will be written in each 30 mins.

Remember this is about the final performance only not the process.

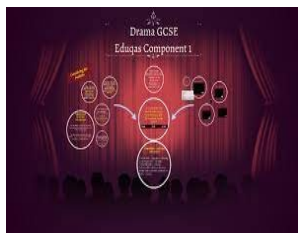
• Cam, Niamh  
• Tia, Daniel

During the rehearsal of Abigail there was a sense of mystery to the performance, as she is a new character who no one knew anything about. She has a large impact on all the characters but also the performance as a whole because nobody knew when to expect from her leaving people on edge and engaged at the same time, much like the original. This is why she gets the role as a new part on the trial of Martha Corey because she and Maddy are originally friends with her until she betrays them. She and Maddy were best friends with her until she betrays them. She and Maddy were best friends with her until she betrays them. She and Maddy were best friends with her until she betrays them.

There were many planning lessons that made the performance what it is and as a group we all had to follow the steps to success. This started with brainstorming our ideas, choosing and writing a description of our set and ideas. Once we had chosen our stimuli and began brainstorming we decided our characters and began to think of scenes in which would take place. We decided Abigail would be a new girl, so when she betrays Martha Corey she would not like the new girl, as she sees a threat to her popularity, and soon began looking for friends who become friends with Abigail. The new girl would be used to Martha's lack of friends, so she would be spreading rumours, thoughts and rumours about Martha Corey being a witch. People began to believe the rumours and she is taken to court where she gets punished to be punished by her by following her movements, much like the original. Martha Corey, Abigail's partner, is taken to the courtroom, watching the trial of a witch but when Abigail betrays her, it is also revealed she is a witch.

During the brainstorming we also decided on the time era. This was chosen from the 17th century to modern day. By changing it to modern day we have made it more relatable as the characters are partly portrayed for high school people in modern society. We made this well as the performance more relatable for the audience and help to give them a better understanding.

Next we had to find research of the characters on our chosen stimuli so we explored the trial of Martha Corey through people. This helped us understand the stimulus better and gave more ideas from the original to



# Year 10 BTEC Dance Subject Term Knowledge Organiser

## Component 1- Exploring the Performing Arts Jazz Dance

Students will gain a **practical appreciation** of practitioners' work in using existing performance material in dance. They will learn how they may respond to or treat a particular theme or issue. How they also use/interpret/modify a pre-existing style and how they communicate ideas to their audience through stylistic qualities.

### Bob Fosse- choreographer

Characteristic of his style is a type of trio dance, with its forward thrust of hips, hunched shoulders, turned-in feet and sharp, jazzy movements enhanced by sound effects. Derbies and animated hands became trademarks of his work

- Fosses show-stopping ability came from the knowledge of how to build a number to a climax, to give it a beginning, middle and end – and his ability to do it with sex and humour.
- Fosse dancers must be able to isolate everything, right down to their eyeballs, elbows and fingers. When a Fosse dancer learns to focus her energy in stillness, she can grab the audience with a simple flutter of her fingers. "It should look like you're not working at all—but you'll come off stage sweating."

### Overview of key features:

- Sound effects (clapping hands, stamping feet, fsss sounds)
- Percussive rhythms
- Derbies and white gloves
- Angular posturing
- Shoulder rolling
- Finger stretching
- Dynamic use of lightening effects
- Percussive sounds which are a key feature of Jazz genre.
- Undercurrent of sensuality



**CHICAGO** focuses on the theme of celebrity and what people will do to achieve it. Neither Roxie nor Velma murder purely for publicity, but once they have they are eager to exploit their newly found fame to the full.

### Historical context

The piece was set in 1924 and Chicago was based on real stories. In particular, the 1926 play by Maurine Dallas about the murders and trials of Belva Gaertner and Beulah Annen. This meant Chicago's press and public became riveted by the subject of homicides committed by women. The time of Vaudeville was a very popular art form in the 1920's consisting of a diverse series of short acts. In the 2000 film version before Velma goes on stage you can hear the director say "on in five" meaning that this was part of a Vaudeville variety show.

### ROXIE HART- main character

As pretty as she is self centred, Roxie Hart's unrelenting search of fame and glory forms the spine of "Chicago". Not very bright and never thinking about the consequences of her actions, Roxie makes bad decisions throughout the show – all in the name of public recognition. Her wannabe vaudeville mind set lasts throughout the entire show.

### Velma Kelly-main character

Tough, sexy, and sarcastic, Velma Kelly is a vaudeville performer who resides in Cook County Jail after she murdered her cheating husband and sister. Used to being the "main attraction", Velma fiercely competes with up and coming rival superstar Roxie for the attention of the press and to preserve her celebrity status. In Brechtian style, Velma often breaks the fourth wall and addresses the audience directly to explain certain events within the show and express herself in the style of Fosse.



# Year 10 HT2 Knowledge Organiser for BTEC Sport— Unit 1 Fitness for Sport and exercise



## Exercise Intensity

**Aerobic endurance** = It is the ability of the cardio-respiratory system to efficiently supply nutrients and oxygen to working muscles during sustained physical activity.

**Muscular strength** = The maximum force a muscle or muscle group can produce. (Measured in N or KG)

**Muscular endurance** = It is the ability of a muscle or group of muscles to keep contracting over a period of time against light to moderate load.

**Flexibility** = Having an adequate range of motion in all joints of the body. It is the ability to move a joint through its complete range of movement.

**Speed** = The ability to perform a movement or cover a distance in a short period of time = distance/time taken.

**Body composition** = This is the relative ratio of fat mass to fat free mass (vital organs, muscle, bone) in the body



## Components of Fitness — Skill

**Balance** = The ability to maintain your centre of mass over a base of support. A performer may need static or dynamic balance.

**Agility** = The ability of a sports performer to quickly and precisely move or change direction without losing their balance.

**Coordination** = The smooth flow of movement needed to perform a task efficiently and accurately. It often involves being able to use 2 or more body parts together.

**Reaction Time** = The time taken for a sports performer to respond to a stimuli and the start their response.

**Power** = The work done in a unit of time. It is the ability to apply a combination of strength and speed.  $\text{Power} = \text{Force (kg)} \times \text{Distance (m)/time (min or s)}$

## Keywords

**Cardio-Respiratory** = The heart and blood vessels working with the lung and the airways to carry oxygen to the muscle.

**Contracting** = This is when the muscles shortens to create a movement Accelerative

**Speed** = Gradually increasing your speed Pure Speed = Your maximum speed.

**Endurance** = The ability to prolong the amount of time near maximum speed Static

**Balance** = Balancing without moving Dynamic Balance = Balancing when moving

**Stimuli** = Something which causes a response or movement





# Year 10 HT2 Knowledge Organiser for BTEC Sport—

## Unit 1 Fitness for Sport and exercise

### Exercise Intensity

#### Measuring Heart Rate

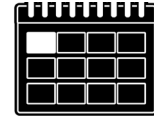
1. Sit Down
2. Locate your radial with your index and middle finger
3. Don't use your thumb—it has its own pulse
4. Count the beats from 30 seconds and times it by 2 to find your BPM



### Basic Principles of Training

We apply principles of training to our training programmes so that we make it effective and make sure it aids progression.

#### The Basic Principles of Training



### Training Zones

Speed Zone = 95% to 100% of MHR

Anaerobic Training Zone = 85% to 95% of MHR

Aerobic Training Zone = 60% to 85% of MHR



### The Borg Scale - Rate of Perceived Exertion (RPE)

The Borg scale is used to predict or estimate the Heart Rate of an individual.

Practice by the individual is needed to make their predictions as accurate as possible

The individual rates themselves from 7 to 20 on the scale.

They then times this by 10 to get an estimated HR

$RPE \times 10 = HR$  (BPM)

**Frequency** = How often we train Increasing the number of days

**Intensity** = How hard we train Increasing the number or reps

**Time** = How long we train Increasing the time we train

**Type** = How we train selecting the correct training method

The FITT principle is part of the Additional Principle of **PROGRESSIVE OVERLOAD.**

This is the gradual increase of a training load, when done correctly it will progressively increase Frequency, Intensity, Time and Type to develop fitness gains

### Key terms



**Heart Rate (HR)** = The amount your heart beats in 1 minute (BPM)

**Maximum Heart Rate (MHR)** = The maximum your heart will beat in 1 minute,  $220 - \text{Age} = \text{MHR}$

**RPE** = Rate of Perceived Exertion (How hard we think we have worked)



# Year 10 Subject Term Knowledge Organiser: Business Studies

## Topic 1.1 Enterprise and Entrepreneurship

= means connective

### What is a Dynamic Business?

A business that responds to what customers want

### Why new business ideas come about:

- changes in technology
- changes in what consumers want
- products and services becoming obsolete (don't need it anymore e.g. CD player).

### Explain one way (how) an entrepreneur might identify a new business idea?

- original ideas
- adapting existing products/services/ideas

### Benefit of having an original idea

- There is a lack of competition = the business can charge a higher price

### Drawback of having an original idea

- More expensive as the business has to complete research to make sure there is a gap in the market

### Benefit of adapting a

- There is a lack of competition = the business can charge a higher price

### Drawback of having an original idea

- More expensive as the business has to complete research to make sure there is a gap in the market

### Why a business would adapt it's existing products?

- To keep up with changes in what customers needs – if they don't customers won' be satisfied

**Risk:** - reduced by carrying out market research or writing a business plan

- Business Failure
- Financial loss
- Lack of Security (no guaranteed pay check)
- **Reward** (also reason why you would set up your own business):  
Business Success
- Profit
- Independence (being your own boss)

### The role of business enterprise and the purpose of business activity:

to produce goods or services, to meet customer needs, to add value:

**Good:** Something you can touch e.g. a car, tin of beans, denim jacket

**Service:** Something someone does for you e.g. accountant, lawyer, hairdresser

### The role of an entrepreneur

- Organises resources
- Makes business decisions
- Takes risks.

### Opportunity that the introduction of new technologies creates for business

- Allows business to create new products that have more advanced features
- Can have an e-commerce website and therefore sell worldwide

### Factors that an entrepreneur must consider before opening a business

- The amount of competition
- Does the product meet the needs of customers

# Year 10 Subject Term Knowledge Organiser: GCSE Business Studies

## 1.2 Spotting a Business Opportunity: Market Segmentation

### WAYS to Segment the Market:

- Age
- Gender
- Occupation
- Income
- Geographic
- Lifestyle

The BENEFITS of market segmentation

- Allows for better **advertising**
- Ensures products fully meet the needs of customers

The BENEFITS of a market map

- Shows a gap in the market

The purpose of Market Research

- To reduce **risk**
- To help with **decision making**
- To gain **customers' views** and understand what they **want**

### Primary Research/Field Research

Gathering data and information that has **NOT** been collected

- Observations
- Questionnaires
- Surveys
- Focus groups
- Consumer trials

### Primary Research/Field Research

#### Advantages:

- Relevant/ Up to date
- Specific to the organisation
- Only your business has the information, your competitor don't

#### Disadvantages:

- Costly
- Time Consuming

### Secondary/Desk Research

Gathering data and information that has **ALREADY** been collected before

- Books/newspapers/magazines
- Sales Data
- Competitors' data
- Government statistics
- Purchased research material (e.g. Mintel)
- The internet

### Secondary Research/Desk Research

#### Advantages:

Cheap  
Quick to get

#### Disadvantages:

- May not be up to date or reliable
- Competitors can get the same information as you.
- Not Specific to your business

### Types of Data

QUANTITative Data (think **QUANTITY**). This is numerical data made up of numbers e.g. Surveys or Sales Data: **+** Easy to analyse = can be completed quickly = changes can be implemented quickly **-** = Don't know the reason why – could lead to bad decisions

QUALITative Data (think **QUALITY**). This is data made up of people's opinions. You get the "Why behind the people's answers. This is from **Focus groups or Interviews**. **+** know the reason why – leads to better decisions. **-** difficult to analyse therefore takes a long time to do

## What is Resource Reliance?

Resources are things that humans require for life or to make our lives easier. Humans are becoming increasingly dependent on exploiting these resources, and as a result they are in high demand.

### Resource Required

Resources such as food, energy and water are what is needed for basic human development.

#### FOOD



Without enough nutritious food, people can become **malnourished**. This can make them ill. This can prevent people working or receiving education.

#### WATER



People need a supply of **clean and safe water** for drinking, cooking and washing. Water is also needed for food, clothes and other products.

#### ENERGY



A good supply of energy is needed for a basic standard of living. People need **light and heat** for cooking or to stay warm. It is also needed for industry.

### Demand outstripping supply

The demand for resources like food, water and energy is rising so quickly that supply cannot always keep up. Importantly, access to these resources vary dramatically in different locations

#### 1. Population Growth



- Currently the global population is **7.3 billion**.
- Global population has risen **exponentially** this century.
- Global population is expected to reach **9 billion by 2050**.
- With more people, the **demand** for food, water, energy, jobs and space **will increase**.

#### 2. Economic Development



- As **LIDCs** and **EDCs** develop further, they require **more energy** for industry.
- LIDCs** and **EDCs** want similar lifestyles to **ACs**, therefore they will need to **consume more resources**.
- Development means **more water is required** for food production as diets improve.

#### Resource Reliance Graph

**Consumption** – The act of using up resources or purchasing goods and produce.

**Carry Capacity** – A maximum number of species that can be supported.

**Resource consumption exceeds Earth's ability to provide!**



#### 3. Changing Technology and Employment

- The demand for resources has driven **the need for new technology** to reach or gain more resources.
- More people in the **secondary and tertiary industry** has increased the **demand for resources** required for electronics and robotics.

## Reasons for NOT Meeting Modern Resource Demands.

<b>Climate</b>	<ul style="list-style-type: none"> <li><b>Global warming</b> effects cycles and seasons and therefore farming.</li> <li><b>Rainfall patterns</b> are changing and are becoming unpredictable. This is a problem for farming.</li> </ul>
<b>Geology</b>	<ul style="list-style-type: none"> <li>Not all countries have <b>access to fossil fuels</b> or suitable landscape for renewables.</li> <li>Many <b>minerals are finite</b> and therefore once used will reduce the resources available.</li> <li><b>Rock types</b> might limit the availability to store water.</li> </ul>
<b>Conflict</b>	<ul style="list-style-type: none"> <li><b>War</b> can disrupt transport of resources by damaging roads and water pipes.</li> </ul>
<b>Poverty</b>	<ul style="list-style-type: none"> <li>LIDCs are unable to <b>afford technology</b> to effectively exploit the natural resources available.</li> </ul>
<b>Natural Hazards</b>	<ul style="list-style-type: none"> <li><b>Increase in hazard events</b> due to climate change.</li> <li>Prime agricultural regions in Asia and Africa and are also in <b>hazard zones</b>.</li> <li>Has the ability to <b>destroy infrastructure</b> needed to transport resources.</li> </ul>

## Environment and Water: Reservoirs and Water Transfer

	Methods	Environmental and Ecosystems
<b>Reservoirs</b>	Increasing <b>storage to hold more water</b> and constructing more dams to <b>control river flow</b> can provide a reliable source of water.	<ul style="list-style-type: none"> <li>Can <b>flood</b> a large area of land and damage <b>habitats</b> and <b>natural landscapes</b>.</li> <li>Dams can be a <b>barrier for certain species</b> to migrate upstream.</li> <li>Natural flow of sediment is disrupted, which then <b>reduces fertility of land</b> further down.</li> </ul>
<b>Water Transfer</b>	Constructing pipes and canals to divert water surplus to areas in need of a water supply.	<ul style="list-style-type: none"> <li>Large-scale engineering works can <b>damage ecosystems</b> along the route.</li> <li><b>Lots of energy</b> is required to pump water over long distances.</li> </ul>

### Food Security

'**Food Security**' is when people at all times need to have physical & economic access to food to meet their dietary needs for an active & healthy life. This is the opposite to '**Food Insecurity**' which is when someone is unsure when they might next eat.

#### Human



- Poverty** prevents people affording food and farmers buying modern equipment.
- Poor infrastructure** makes food difficult to transport fresh food.
- Conflict** disrupts farming and prevents supplies.
- Food waste** due to poor transport and storage.
- Climate Change** is affecting rainfall patterns making food production difficult.

#### Physical



- Temperature** needs to be ideal for certain crops to grow.
- The **quality of soil** is important to ensure crops have the necessary nutrients.
- Water supply** needs to be reliable to allow food to grow.
- Pest, diseases and parasites** can destroy vast amounts of crops that are necessary to feed large populations.
- Extreme weather** events can damage crops (i.e. floods).

# Resource Reliance

## Environment and Food: Fishing and Farming



	Methods	Environmental and Ecosystems
<b>Fishing</b>	<b>Bigger nets and fishing boats</b> have allowed for greater catches. <b>GPS and sonar</b> has also find the fish easily.	<ul style="list-style-type: none"> <li><b>Overfishing</b> of certain fish has caused their decline.</li> <li><b>Dredging</b> can damage seafloor habitats.</li> <li>Decline of one species has a <b>knock on</b> effect on other marine species.</li> </ul>
<b>Farming</b>	<b>Tractors, computer programming and GPS</b> technology is producing food more effectively and at a larger scale.	<ul style="list-style-type: none"> <li>Field sizes have caused <b>hedgerows to decline</b> in biodiversity.</li> <li><b>Fertilisers and pesticides</b> enter water courses and harm or kill organisms.</li> <li>Heavy machinery can cause <b>soil erosion</b>.</li> </ul>

## Environment and Energy: Deforestation and Mining



	Methods	Environmental and Ecosystems
<b>Deforestation</b>	Logging using <b>modern machinery and transportation</b> has made deforestation more productive & convenient.	<ul style="list-style-type: none"> <li><b>2 billion people depend on wood</b> for fuel, which therefore creates high <b>CO2 emissions</b></li> <li>Forests provide for <b>important habitats</b>.</li> <li>Clearing of forests leads to <b>soil erosion</b>.</li> <li>Tree intercepts rain and <b>prevents flooding</b>.</li> </ul>
<b>Mining</b>	Large machines and drill technology can remove and reach through material effectively.	<ul style="list-style-type: none"> <li>Mining waste can <b>pollute soil and contaminate water</b> supplies.</li> <li><b>Habitats are destroyed</b> in mining zones.</li> <li>Fossil fuels burnt <b>release greenhouse gases</b></li> </ul>

## Malthus and Boserup's Theories about Food Supply

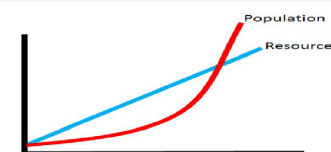
With the population growing very quickly, there are different ideas about whether or not this will lead to a food crisis.

### Malthus Theory

- Believed that **population would increase faster than food supply**.
- This would lead to a lack of food being available.
- Malthus believed this would cause **large scale famine, illness and war**
- This would occur until population returned to level that can be supported.

### Boserup Theory

- Believed that however big the population grew, **people would find ways to manage**.
- If food supplies became limited, **people would find new ways** to increase production.
- These solutions would often involve **creating new technologies**.



## Measuring Food Security

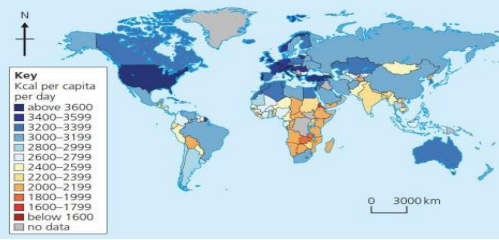
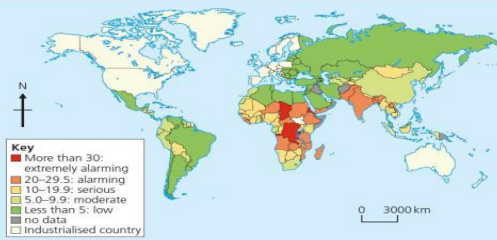
## Attempts to Achieve Food Security

Food security varies around the world. Some people and places are more food secure than others. This can often depend on how much a country can grow and is able to afford.

There are various measures to maintain or even improve our food security. These measures are often taken to be **socially, economically, environmentally** viable for the longer term.

### The Global Hunger Index

### Daily Calorie Intake



- This shows how many people are suffering from **hunger or illness** caused by lack of food.
- The index gives a value for each country from **0** (no hunger) to **100** (extreme hunger).

- This shows how many **calories per person** that are consumed on average for each country.
- This can indicate the global distribution of **available food** and **food inequality**,

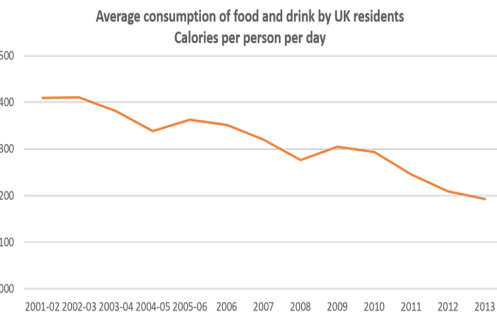
### Case Study: UK Food Security



#### Food Availability in the UK

The UK population is around **65 million** and enjoys a **high level of food security**.

- The UK **produces 68% of its own food** but this is steadily decreasing.
- The UK **has to import** the rest, especially seasonal food such as fruit and vegetables.
- Food production in the UK has increased by **intensifying agriculture**.



#### Food consumption in the UK

Average daily calorie intake in the UK has **decreased** from **2600** in **1960** to **2150** by **2000**.

Reasons for this decrease includes:

- More people being **more active in the past** and having physical jobs.
- More **awareness of having a good diet** and problems surrounding obesity.
- The price of food has increased.

#### Success in securing local food security

##### Food Banks

- This is food that is **donated** by the public.
- They help people with a **sudden loss of income**.
- It is estimated that **1 million people** rely on food banks for their own food security.

##### Urban Gardens

- These are **large projects** where groups work together to grow food and **promote healthy living**.
- This can involve planting crops in urban environments such as roundabouts.

#### Effectiveness of present attempts at food security

Recently the UK has been promoting sustainable intensification, involving food security and supporting the environment.

- New technology** such as **hydroponics** help a range of foods to be grown all year round.
- However, this method is **expensive** for producer and consumer.

### Social

### Economic

### Environmental

### Ethical Consumerism



This involves buying products that have a **positive social, economic and environmental impact** today, without **compromising future generations**.

#### Fairtrade

- This is a global movement to give farmers a **fairer price for their products**.
- The profits benefit the community **with schools and medical facilities**.
- Involves using farming methods that **protects rather than destroys environments**.

#### Food Waste

- One-third of all food gets lost or wasted.
- Aim to **eat locally sourced food** to reduce waste through transport.
- Eating 'ugly' food despite it not being 'ideal' can prevent waste and **save money**.
- Prevents wasted energy for producing food and therefore **reduces CO2 emissions**.

### Food Production



This involves **producing as much food as possible** in as small a space as possible. They often involve using machines and chemicals to gain as much produce as they can.

#### Intensive Farming

- Makes the most of the land and allows for higher yields. This can make growing food more **productive and therefore cheaper** to produce.
- Chemical fertilisers, pesticides and herbicides can **pollute the environment** and **harm people, animals and insects**.

#### Organic Methods

- This involves the banned use of chemicals and **ensuring animals are raised naturally**.
- This can lead to **lower yields of 20%** and products being **more expensive**.



### Technological Developments

Through better understanding of science and improved technology, it is now possible to **change the food we grow and protect and harvest the crops more effectively**.

#### Genetically modified (GM)

- Involves changing the DNA of foods to enhance their productivity and properties.
- Crops can be **better protected from disease and drought**, but also made larger or include more **health benefits**.

#### Hydroponics

- This is a method of growing plants without soil. Instead they use nutrient solution.
- Less water is needed and a **reduced need for pesticides** to be used.
- However, this method is **very expensive** so only used for high value crops.

### Small Scale 'Bottom Up' Approaches



This involves a small scale production of food and relies on **individuals and communities, rather than government or large organisations**.

#### Allotments

- This is an area of land that is divided into plots and rented to **individuals to grow their own fruit and vegetables**.
- Allows people in urban areas to produce their **own cheap & healthy food** close to home.

#### Permaculture

- This involves **people growing their own food** and **changing their eating habits**.
- This can create **more natural ecosystems** and fewer resources are required.

#### Effectiveness of past attempt at food security

**Intensification of farming from 1940s to the 1980s** attempted to increase production by;

- Higher yields** of crops and animals
- Monoculture** by growing one crop in a large area.
- Irrigation** with better groundwater pumping.
- Chemicals** with improved fertilisers and pesticides.
- Mechanisation** for sowing and harvesting.



# Year 10 MUSIC GCSE HT 1 & 2 Knowledge Organiser

(“Classical” music)

Area of Study 2:

The Concerto  
through Time

Baroque  
era

Classical  
era

Romantic  
era

(Music from other  
countries)

Area of Study 3:

Rhythms of the  
World

India

Africa

Greece,  
Palestine &  
Israel

South  
America

Area of Study 4:

Film music

Area of Study 5:

Conventions of  
Pop

Rock & Roll  
50s & 60s

Rock  
Anthems  
70s, 80s

Pop  
Ballads  
70s, 80s  
& 90s

Solo  
artists  
since  
1990

**1.1 1.1.2 Functionality of different software**  
**IT9: Applications software**

**What is applications software?**  
 Software that is designed to perform a specific task. Some applications are designed to handle information, communicate with others or perform a specific set of functions for one organisation.

**Types of applications software**

Word processing software
Desktop publishing software
Presentation software
Spreadsheet software
Database software

Photo editing
Video editing
Webpage editor
Computer-aided design (CAD)
Computer-aided manufacturing

**Information handling software**  
 Software that is able store large sets of data. That could be databases, spreadsheets or any other application that is able to handle information.

**Specialised software**  
 Specialist software is software written to achieve a task for an individual or company. For example, payroll can be managed through spreadsheet software, but organisations opt to use payroll management software

Pros	Cons
Time saving	Initial high cost
More specific purpose	More time to develop
Better support	Not readily available



**1.1** **1.1.2 Functionality of different software**  
**IT9: Applications software**

**What is open-source software?**  
 Proprietary software is software that is owned by one person/organisation and they have exclusive control over it. Open-source software allows users to access the source code and modify the software to meet their needs.

**What is source code?**  
 The part of software that most computer users don't ever see; it's the code computer programmers can manipulate to change how a piece of software works.

Open-source	Proprietary
Very little professional and technical support and no user manuals to troubleshoot.	Professional and technical support available. User manuals provided for troubleshooting.
Reliable as there are community of users constantly creating updated versions.	Stable product that will contain regular updates to automatically fix any bugs.
There are very little or no upfront costs.	Can be costly to buy a license.
Source code can be viewed, shared and modified.	Source code cannot be modified.

**Examples**

Examples of Proprietary Software:  
 Windows, Adobe Web Premium, Microsoft Office, Internet Explorer.

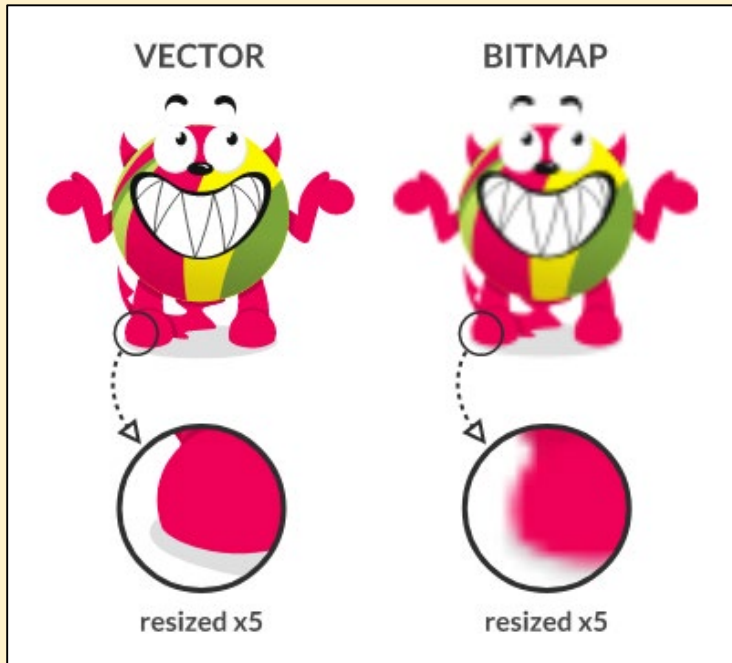
Examples of Open-source Software:  
 Linux, WordPress, Mozilla Firefox, Open Office



### Lesson 3: Image properties

#### Description:

In addition to the pixel data, images occasionally have many other kinds of data associated with them. These data, known as properties, is a simple database of data attached to the images. But graphics can also come in two types: Vector or Bitmap.



#### Bitmap

##### Description:

- An image that is made up of pixels that each contain a colour.

##### Characteristics:

- Commonly used for photographs and web pages.
- Compatible for print and web use.
- Some file formats support transparency.
- Takes up a lot of storage because it needs to store each pixel.
- Can depict very detailed images, since each pixel represents a different colour.
- Needs to be compressed.
- Not scalable and can lose quality when images are enlarged.
- Uses less processing power than vectors.
- Common file formats include jpg and png.
- Each pixel can store a number of bits which represents the colour depth.

#### Vector

##### Description:

- An image that is made up of lines and curves using mathematical equations.

##### Characteristics:

- Commonly used for logos and web icons.
- Limited colour capability; cannot show gradients. Not suitable for photo-realistic images. Most suited to images with few colours.
- Need specialise software to open and edit the graphic.
- Takes up less storage because it only needs to store details about the objects.
- Doesn't need to be compressed.
- Scalable – does not lose quality when enlarged.
- Uses more processing power than bitmaps.
- Common file formats include ai and svg.

# ISLAM: BELIEFS

## Key terms

Greater Jihad	The knowledge that life is a struggle, a test.
Risalah	Prophethood.
Malaikah	Angels.
Akhirah	Belief in the afterlife.
Janna	Heaven.
Jahannam	Hell.
Imam	A God chosen human being who's responsibility is to guide humankind on the teachings of the prophet Mohammad.

## Crucial Commands:

**Describe:** Say in detail what something or someone is like, and the impact it has. E.g. Describe the meaning of the word Omnibenevolent.

**Explain:** Say why something or someone is important, and the impact it has. E.g. Explain why Jesus' death is important to Christians.

**DISCUSS:** Write about at least two points of view and explain why these points of view are valuable or not. E.g. "The most important Christian belief is Jesus' resurrection" (15 marks)

## The 6 articles of faith and 5 roots.

Sunni and Shi'a Muslims both believe in the oneness of Allah and follow the teachings of the Qur'an and Sunnah. Sunni and Shi'a Muslims also agree on the importance of the prophets.

Each branch of Islam has some central beliefs. Sunni Muslims follow the **six articles of faith** and Shi'a Muslims follow the **five roots of Usul ad-Din**.

## What are angels like?

- Muslims believe that angels, or **malaikah**, were created before humans with the purpose of following the orders of Allah and communicating with humans.
- Muslims believe that angels, like all other creatures, were created by God. In Islamic belief, angels communicate messages from Allah to humanity. Angels are important to all Muslims, and in Sunni Islam belief in angels is one of the SIX ARTICLES OF FAITH.

## Janna

Heaven is a state of peace, joy and happiness. It will contain everything longed for on earth and is full of beautiful gardens, sparkling fountains and flowing rivers, reclining sofas, delicious food and delightful serving maidens.

Heaven is a reward for living a faithful and moral life, or suffering persecution because of faith, or fighting in the cause of God. It separates out those who have committed a greater proportion of good deeds to bad, and whose intentions were good as well.

## The nature of Allah.

Muslims believe that Allah has **99** names which can be used to describe him; these can all be found in the Qur'an. There is actually 100 names but only Allah knows the 100<sup>th</sup> name.

- **Al-Rahman**- The beneficent (the compassionate)
- **Al-Rahim**- the most merciful
- **Al-Aziz**- the almighty (the victorious)
- **Al-Hakam**- The judge

## Prophethood.

The Qur'an mentions 25 Prophets, but Islamic tradition says there have been **124,000!**

- Allah chose many prophets to bring his message to all people.
- Each prophet was given Allah's word for their generation, but their words were either ignored, forgotten or distorted.
- Allah had to send a new prophet with the original message several times.
- Prophet Muhammad was the exception as his revelation – the Qur'an was the final revelation.
- Prophets are human (have free will), but are often regarded as the 'best human' (obey Allah fully).

## Jahannam

It is a place of terror, with boiling water, fierce fire and thick black smoke. As well as physical suffering, those condemned to hell will also suffer by being separated from God and having no hope of escape. Some Muslims believe it is not an eternal experience but a short period, with those repenting receiving pardon. After judgement people will cross the very narrow Bridge of As-Sirat. Those who have collected more bad deeds and intentions than good ones, will fall off the bridge as they try to cross the bridge, they end up falling in to hell.

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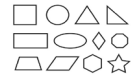
# Year 10 3D Design Knowledge Organiser

## Key Vocabulary



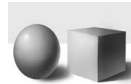
### Line

Line is the path left by a moving point. A line can be horizontal, diagonal or curved and can also change length.



### Shape

A shape is an area enclosed by a line. It could be just an outline or it could be shaded in. Shapes can be geometric or irregular.



### Form

Form is a three dimensional shape, such as a cube, sphere or cone. Sculpture and 3D design are about creating forms.



### Tone

This refers to the lightness or darkness of something. This could be a shade or how dark or light a colour appears. Tones are created by the way light falls on a 3D object. The parts of the object on which the light is strongest are called highlights and the darker areas are called shadows.



### Texture

This is to do with the surface quality of something, the way something feels or looks like it feels. There are two types of texture: Actual texture really exists, so you can feel it or touch it; Visual texture is created using marks to represent actual texture.



### Pattern

A design that is created by repeating lines, shapes, tones or colours. The design used to create a pattern is often referred to as a motif. Motifs can be simple shapes or complex arrangements.



### Colour

Red, yellow and blue are primary colours, which means they can't be mixed using any other colours. In theory, all other colours can be mixed from these three colours.

## Wider Thinking

How to read a sculpture? Get to know the elements of art in sculpture:

<https://www.youtube.com/watch?v=f6JtILFdqns>

## Stretch & Challenge

- Keep it light until it's right – don't press down hard when drawing.
- What formal elements can you see in the painting by Hokusai?

## Colour Theory



This is called a **Colour Wheel**.

### Primary

red + yellow

red + blue

blue + yellow

### Secondary

=orange

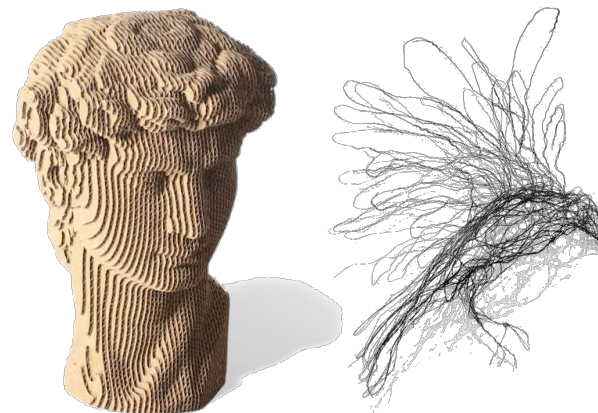
=purple

=green

- **Tertiary colours** are created by mixing a primary colour and the secondary colour next to it on the colour wheel.
- Colours that are next to each other on the colour wheel are called **harmonious**.
- **Complementary** colours are colours that are **opposite** each other on the colour wheel. When complementary colours are used together they create **contrast**. Adding a complementary colour will usually make a darker shade. This is often preferable to adding black.
- **Warm colours** are colours on the red side of the wheel. These are red and include orange, yellow and browns.
- **Cool colours** are colours on the blue side of the wheel. These are blue and include green, purple and most greys.

## Existing Similar Examples

What formal elements can you see in these works?



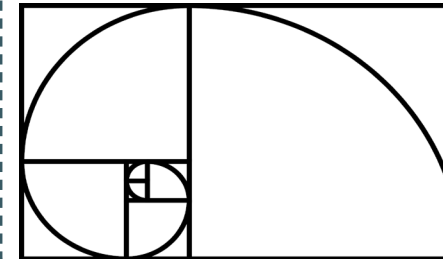
## Composition

The term composition means 'putting together,' and can apply to any work of art or photography, that is arranged or put together using conscious thought. There are numerous approaches or "compositional techniques" to achieving a sense of unity within an artwork, depending on the goals of the artist.

For example, a work of art is said to be aesthetically pleasing to the eye if the elements within the work are arranged in a balanced compositional way. However, there are artists such as Salvador Dali whose sole aim is to disrupt traditional composition and challenge the viewer to rethink balance and design elements within art works.

### Fibonacci Spiral:

Artists recognised that the Fibonacci Spiral is an expression of an aesthetically pleasing principle – the Rule of Thirds. This is used in the composition of a picture; by balancing the features of the image by thirds, rather than strictly centring them, a more pleasing flow to the picture is achieved.

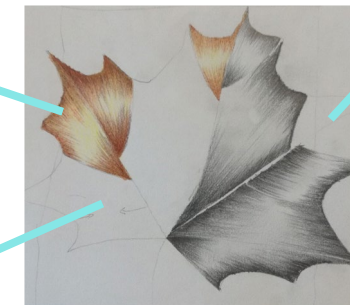


Mary's Shell sculpture by Chris Brammall

## Expert modelling example

When blending colour with tone layer at least two colours.

Use a light line when sketching.



Use the 'flick' technique to blend smoothly between different tones.

# Mis estudios



Subjects



Opinions



Teachers



Uniform

School subjects	Estudio - I study	el arte dramático/el teatro - drama el dibujo - art el español - Spanish el inglés - English la biología - biology la educación física - pe la física - physics el francés - French el alemán - German la geografía - geography la historia - history la informática - computing la química - chemistry la religión - RS la tecnología - technology la sociología - sociology las matemáticas - maths las ciencias - science las empresariales - business las lenguas/los idiomas - languages	porque - because  es - it is  son - they are	me interesa - interests me me aburre - bores me me fascina - fascinates me me importa - is important to me fácil - easy difícil - difficult duro - hard útil - useful inútil - useless práctico - practical creativo - creative relevante - relevant relajante - relaxing exacto - precise lógico - logical exigente - demanding
	Mi asignatura preferida es... - My favourite subject is...  Me chifla - I'm crazy about  Prefiero - I prefer			me aburre como una ostra - it bores me to death es pan comido - it's a piece of cake  mejor que... - better than peor que... - worse than tan...como... - as...as...

Teachers	El/la profesor/a de (ciencias) - My (science) teacher	es - is  paciente - patient tolerante - tolerant listo - clever trabajador(a) - hardworking simpático - nice	impaciente - impatient severo/estricto - harsh/strict tonto - silly/stupid perezoso - lazy antipático - mean/unpleasant
		enseña bien - teaches well explica bien -explains well tiene buen sentido del humor - has a good sense of humor tiene expectativas altas - has high expectations crea un buen ambiente de trabajo - creates a good working atmosphere nunca se enfada - never gets angry me hace pensar - makes me think nos da consejos/estrategias - gives us advice/strategies nos pone muchos deberes - gives us a lot of homework	

Uniform	Tengo/tenemos que llevar... - I/we have to wear (No) llevo/llevamos - I/we (don't) wear Es obligatorio llevar... - it's compulsory to wear No me gusta llevar - I don't like wearing	un jersey - a jumper un vestido - a dress una camisa - a shirt una corbata - a tie una falda - a skirt unos zapatos - shoes unos calcetines - socks unas medias - tights	blanco - white negro - black morado - purple	porque/ya que/ dado que - because	mejora la disciplina - improves discipline limita la individualidad - limits individuality da un imagen positiva del insti - gives a positive impression of the school ahorra tiempo por la mañana - saves time in the morning
	Ojalá pudiera llevar... - If only I could wear...	unos vaqueros - jeans zapatillas de deporte - trainers	una sudadera - a hoody		

Estudio <b>diez</b> asignaturas <b>incluso</b>	I study <b>10</b> subjects <b>including</b>
El <b>inglés</b> , las <b>matemáticas</b> , las <b>ciencias</b> y el <b>dibujo</b> .	<b>English, maths, science</b> and <b>art</b> .
Mi asignatura preferida es	My favourite subject is
La <b>biología</b> <b>ya que me fascina</b>	<b>biology because it fascinates me</b>
y me gustaría trabajar como <b>biólogo marino</b> en el futuro.	and I would like to work as a <b>marine biologist</b> in the future
<b>aunque puede ser</b> muy <b>difícil</b>	<b>although it can be</b> very <b>hard</b> .
<b>Además</b> me chifla <b>el dibujo</b> porque	<b>Moreover</b> I'm crazy about <b>art</b> because
soy una persona <b>creativa</b> y lo <b>encuentro relajante</b>	I'm a <b>creative</b> person and I <b>find it relaxing</b>
y la profe es <b>paciente</b>	and the teacher is <b>patient</b>
y <b>crea un buen ambiente de trabajo</b>	and <b>creates a good working atmosphere</b>
<b>mientras que</b> mi profe de <b>matemáticas se enfada mucho</b>	<b>whereas</b> my <b>maths</b> teacher <b>gets angry loads</b>
y <b>nos pone muchos deberes</b> .	and <b>gives us lots of homework</b> .
También, no aguanto <b>el inglés</b> <b>dado que</b>	Also I can't stand <b>English</b> <b>because</b>
<b>me aburre como una ostra</b> .	<b>it bores me to death</b> .
Cuando era más joven estudiaba <b>la tecnología</b>	When I was younger I used to study <b>technology</b>
pero <b>no me gustaba</b> ya que	but <b>I didn't like it</b> because
era <b>duro</b> y <b>inútil</b> y	it was <b>hard</b> and <b>useless</b> and
<b>no me interesaba nada</b> .	<b>it didn't interest</b> me at all.

↑                      ↑                      ↑  
**A model text on school subjects**



# El colegio



School facilities



School rules

School facilities	<p>En mi instituto hay... - in my school there is                  mi insti tiene - my school has                  Mi escuela primaria tenía - my primary school had                  En mi escuela primaria había - in my primary school there was...</p>		<p>un salón de actos - a hall                  un comedor - a canteen                  un campo de fútbol - a football pitch                  un patio - a yard/playground                  un gimnasio - a gym                  una piscina - a pool                  una biblioteca - a library                  una pista de tenis - a tennis court                  unos laboratorios - some science labs                  muchas aulas - lots of classrooms                  menos/más exámenes - more/less exams                  más oportunidades para hacer deporte - more sports opportunities</p>	<p>Mi insti es <b>mixto</b> y <b>está situado</b>                  en <b>Liverpool</b>, en el <b>noroeste de Inglaterra</b>.</p>	<p>My school is <b>mixed</b> and it's <b>located</b>                  in <b>Liverpool</b>, in the <b>Northwest of England</b>.</p>
	<p>Mi insti es... - my school is...</p>		<p><b>mixto</b> - mixed  <b>masculino</b> - all boys  <b>privado</b> - private</p> <p><b>feminino</b> - all girls  <b>público</b> - state school</p>	<p>Las clases comienzan a las <b>nueve menos cuarto</b>                  y terminan a las <b>tres y cinco</b>.</p>	<p>Lessons start at <b>quarter to 8</b>                  and finish at <b>5 past 3</b>.</p>
	<p>Las clases comienzan a las _____ - classes start at _____ o'clock                  Las clases terminan a las _____ - classes end at _____ o'clock                  La hora de comer/el recreo dura _____ minutos - lunch/break lasts _____ minutes                  El día escolar es muy largo - the school day is really long</p>			<p>En mi opinión, el día escolar es <b>muy largo</b>                  y un poco <b>aburrido</b>                  pero <b>trabajo como un burro</b>.</p>	<p>In my opinion, the school day is <b>really long</b>                  and a bit <b>boring</b>                  but <b>I work my socks off</b>.</p>
				<p>Me encanta mi insti porque tiene muchas instalaciones  <b>como una biblioteca, una piscina y un campo de fútbol enorme</b>.</p>	<p>I love my school because it has lots of facilities  <b>such as a library, a pool and an enormous football pitch</b>.</p>
School rules	<p>No se debe - you mustn't                  Está prohibido - it's not allowed                  No se permite - you're not allowed</p>		<p>dañar las instalaciones - damage the facilities                  ser agresivo o grosero - be aggressive or rude                  correr en los pasillos - run in the corridors                  usar el móvil en clase - use your phone in lessons                  llevar zapatillas de deporte - wear trainers                  comer chicle - chew gum                  llevar joyas/maquillaje - wear jewellery/makeup</p>	<p>Mi escuela primaria era más <b>pequeña</b>                  y no tenía <b>una piscina</b>                  pero <b>había menos exámenes</b>.</p>	<p>My primary school was <b>smaller</b>                  and it didn't have a <b>pool</b>                  but <b>there were fewer exams</b>.</p>
	<p>Se debe - you must                  Hay que - you have to                  Tienes que - you have to                  Se permite - you're allowed to</p>		<p>ser puntual - be on time                  respetar el turno de palabra - wait your turn to speak                  respetar a los demás - respect others                  trabajar duro - work hard                  escuchar en clase - listen in class                  hacer los deberes - do your homework</p>	<p>Hay muchas reglas en mi insti                  y <b>pienso que formentan la buena disciplina</b></p>	<p>There are lots of rules in my school                  and <b>I think that they promote good discipline</b></p>
	Las normas - the rules	son - are	<p>demasiado estrictas - too strict                  necesarias - necessary                  importantes - important</p>	<p>por ejemplo no se debe <b>ser agresivo o dañar las instalaciones</b>                  pero <b>lo que me fastidia es que</b></p>	<p>for example you mustn't <b>be aggressive or damage the facilities</b>                  but <b>the thing that annoys me is that</b></p>
		<p>fomentan la buena disciplina - promote good discipline                  limitan la individualidad - limit individuality                  fastidian a los alumnos - annoy the pupils</p>		<p>no se permite <b>usar el móvil en clase</b>                  A mi parecer puede ser muy útil.</p>	<p>you're not allowed to <b>use your phone in lessons</b>                  In my opinion, it can be really useful.</p>
Random	<p>Mi horario - my timetable                  La educación infantil/primaria - pre-school/primary education                  La educación secundaria - secondary education                  El bachillerato - A-Level equivalent in Spain                  La formación profesional - vocational training                  El instituto - secondary school                  Suspender/aprobar un examen - to fail/pass an exam</p>		<p><b>El bachillerato</b> - this is the two final years of school. (English equivalent of 6<sup>th</sup> form) It is split into 4 different pathways: arts, sciences, humanities and social sciences. The subjects you study depend on which pathway you have chosen but every student has to study Spanish language and literature, PE and a foreign language.</p>		

↑ ↑ ↑  
**A model text on my school**

# Year 10 Subject Term Knowledge Organiser: Enterprise and Marketing

## Market Research

Anything a business does to find out potential customers' wants and needs is called market research.

**Primary** methods of research generate new data through **surveys, focus groups, observations** and **interviews**. Data can be expensive to gather, especially if a large amount is needed, but it will be more likely to suit a business's research needs.

**Secondary** sources of market research, such as **competitor research, government publications, books** and **newspapers** use data that already exists. Data is cheaper to obtain and quicker as it has already been generated. The data might not be fully applicable to the business's research needs though.

Data generated from research will either be **quantitative** (numbers and percentages) or **qualitative** (written thoughts and opinions).



## Sampling

The people a business asks to take part in their research are known as the **sample**. How this sample is selected is known as a **sampling method**.

- **Cluster** – selecting people within a particular group (e.g. age)
- **Convenience** – selecting people who are near and willing
- **Random** – choosing people without thought
- **Quota** – people from each group represent the full population.

## Customer Profiles

A Customer Profile is a detailed description of a business's main target customer. They're really specific depictions, so they often include the customer name and picture as well as other key details such as their age, gender, spending habits and lifestyle.

## Market Segmentation

Market segmentation is the process of dividing a market into groups – customers are grouped based on key characteristics such as their **age, gender, occupation, income, location** or **lifestyle** (e.g. Poundland™ segments by income).

Businesses segment their market so they can tailor products to suit their target audience and so they can aim their marketing efforts at their target customer.

## Customer Profile Example

**Name:** Gary Asher

**Age:** 39

**Occupation:** Decorator

Gary lives in Derby with his wife who he married in 2015 and their two children, Izzy and Abbie.

He works full time and, as he has two young children, lives a busy life. He enjoys eating out with his family and plays football at the weekend with a group of friends. He is trying to save as much money as possible to put towards a new house.



# R068

## KNOWLEDGE ORGANISER

### Key Calculations

**Revenue:**

$$\text{Selling Price} \times \text{Number Sold}$$



**Total Costs:**

$$\text{Fixed Costs} + (\text{Variable Cost for 1} \times \text{Number Sold})$$

**Profit or loss:**

$$\text{Revenue} - \text{Total Costs}$$

*It's a loss if the answer is negative*

**Break-even:**

$$\frac{\text{Fixed Costs}}{\text{Selling Price} - \text{Variable Cost per Unit}}$$

*The answer is given in units, not pounds*

## Design Mix Model

This is the combination of what a product does (**function**) with how it looks (**aesthetics**) and how much it costs to make (**economic manufacture**).

New products start as ideas, presented as **mind maps, brain shifters, mood boards, sketches** or **drawings**.

## Pricing

When businesses set a price for a product or service, they consider many factors including being able to cover their costs in order to make a **profit**.

**Pricing strategies** are specific approaches businesses can use when setting their prices and include:

**Competitive Pricing** – where businesses base their prices on those of their rivals.

**Psychological Pricing** – where businesses avoid round/whole numbers for their prices.

**Price Skimming** – where businesses set a high price for a new product and lower this price over time. (£)

**Price Penetration** – where businesses set a low initial price, later increasing this price.

## Risk and Viability

Setting up a new business or launching a new product can be **risky** for a person/business. Market research helps reduce this risk.

**Viability** refers to how successful a product might be – often based on finances – is the break-even point realistic, for example.