All Saints' Academy Cheltenham

Year 10

Cycle 2

Curriculum Organiser

Name : _____

Tutor : _____

Contents Page

All Saints' Academy Home School Agreement – 2024/25

All Saints' Academy recognises that the successful development of its students depends on an effective partnership of the Academy, students and parents/carers.

All three parties share responsibility for the development and achievement of each student. Together we commit ourselves to the following:

The Academy will:	Parents/Carers will:	Students will:
• Provide a learning environment that is stimulating, safe and caring. • Treat everyone with respect. • Ensure that each student has the opportunities, support and guidance to achieve their full potential. • Report regularly on each student's progress. • Expect high standards, set clear rules, promote mutual respect and develop a sense of responsibility. • Keep parents informed about Academy matters, be welcoming to enquiries and responsive to concerns. • Set homework in line with the published timetable, and give feedback on tasks completed. • Record and reward good progress and performance. • Offer enrichment activities that will develop broader skills to prepare for life and the world of work.	• Make sure their child attends in correct uniform, arrives on time and is properly equipped. • Encourage their child to work hard and support them in their homework. • Attend consultation evenings and discussions about their child's progress. • Support the Academy's policies and guidelines as published on the Academy website. • Allow their child to attend off-site visits during the day. • Agree to the sanctions system as set out in the Academy Ready to Learn Policy. • Ensure their child attends every day and that time out of school is not taken or requested, unless for an urgent reason. • Inform staff, if they have concerns about their child's progress, well-being or any other issues. • Encourage their child to participate in the enrichment opportunities offered by the Academy.	• Be an ambassador for All Saints' Academy. • Work hard in class and at home to achieve their full potential. • Treat others as they would wish to be treated and live out the Academy values. • Attend the Academy in correct uniform, be on time and properly equipped. • Keep the Academy rules, behave responsibly and be polite to others in the Academy, and in the wider community. • Follow the Ready to Learn Policy, completing any sanctions set and striving to achieve rewards each week. • Understand that any misbehaviour in the community whether in uniform or not, will be treated as if the incident happened in the Academy. • Take part in enrichment activities offered by the Academy. • Care for the environment in and outside the Academy.

Signed by Form Tutor	Signed by Parent/Carer	Signed by Student
.....	.....	.....

Independent homework timetable

Subject	Week 1 day	Week 2 day
English		
Maths		
Biology		
Chemistry		
Physics		
RE		
Option subject 1:		
Option subject 2:		
Option subject 3:		

Why study?

All students study because they value opportunities to learn and improve.

All students understand that in order to make excellent progress towards bright futures, they need to take responsibility for their own success and study at home as well as at the Academy.

We want you to have the very best opportunities available to you when you leave the Academy. Achieving excellent exam results in Year 11 and Year 13 is one way to help you to do that.

To gain excellent exam results in Year 11 and Year 13, you need to work hard in school every single lesson, every day in Year 7, 8, 9, 10 and 11. If you are in the Academy every day for 5 years you will have 4,750 hours of study time.

We want to make it as easy as possible for you to complete your study away from the Academy. Completing one hour of study per evening at home adds up to an extra 950 hours over your five years with us – which is like having an extra year of learning.

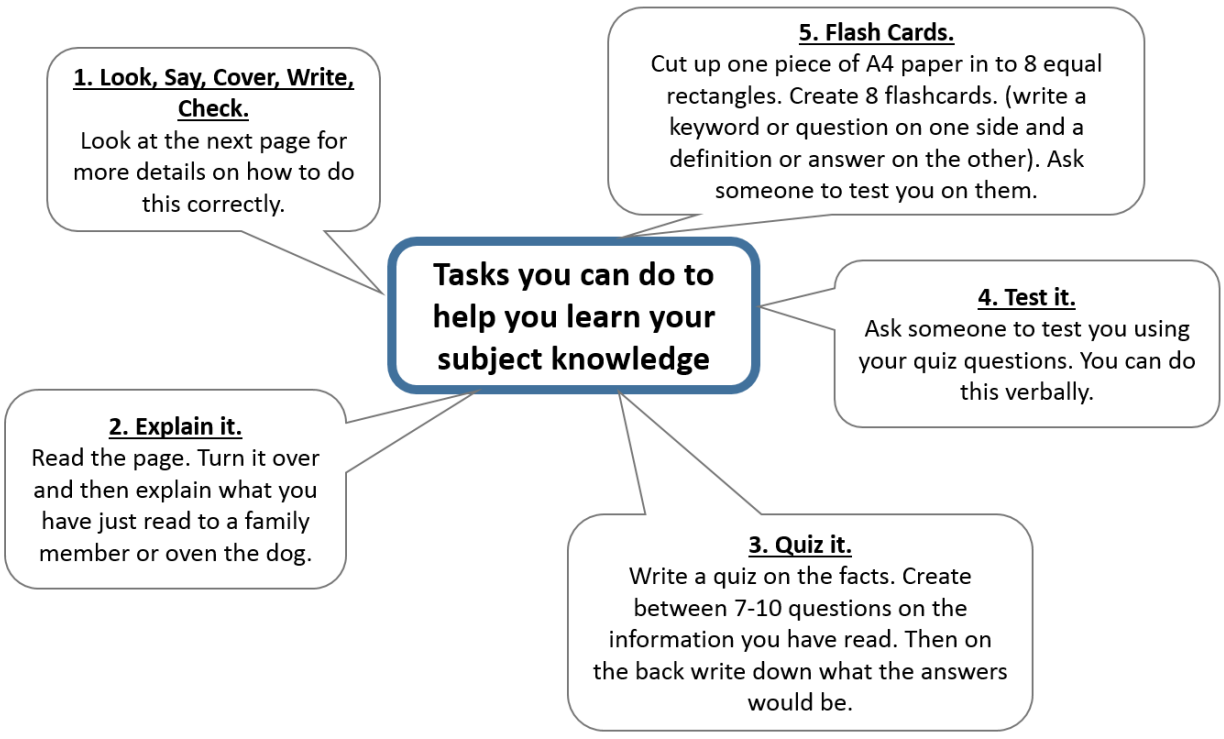
When and what should I study?

You should complete your Independent homework timetable on page 3, so that you know when to study.

Year 7, 8 and 9 should be completing one hour of homework each evening.

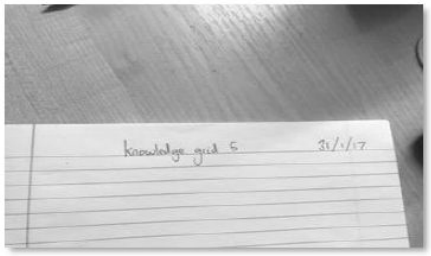
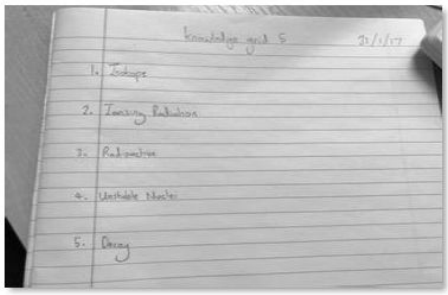
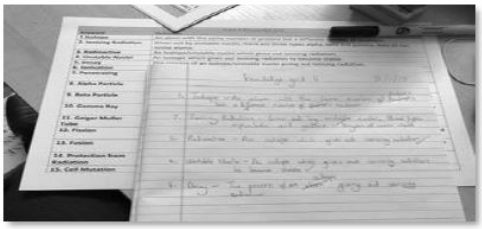
Year 10 and 11 should be completing two hours of homework each evening.

How should I use my Knowledge Organiser to study?



How should I use my Knowledge Organiser to study?

Look, Say, Cover, Write, Check

Step 1		1) Write the date and the title from the knowledge organiser. Underline them.
Step 2		2) Write out the keywords you have been asked to learn, leaving two lines between each word.
Step 3		3) Cover the definitions apart from the first: read it, cover it, say it in your head, check it until you are confident with it. Repeat this process with the other words and take your time.
Step 4		4) Cover up each definition in turn and write them out from memory. Avoid cheating as you need to know how much you can remember. Don't expect yourself to get it exactly right first time.
Step 5		5) Correct your answers in green pen. Repeat the process.

SPAG: Spelling, Punctuation and Grammar

Punctuation

Sentence demarcation:

Symbol	Name	Use
A, N	Capital letters	To start a sentence.
.	Full stop	To show a point/ idea is finished.
!	Exclamation mark	To illustrate heightened emotions, either positive or negative
?	Question mark	To illustrate a question is being asked.
…	Ellipsis	To build tension at the end of sentence or to leave a sentence unfinished for effect.

In sentence punctuation:

Symbol	Name	Use
,	Comma	Following an adverb or connective which starts a sentence or to join a subordinate and main clause together.
" "	Speech marks	To indicate the start and end of direct speech.
( )	Brackets	To put additional information into a sentence.
'	Apostrophe	To show a contraction (joining of two words) or omission (taking out of a letter).

Ambitious punctuation:

Symbol	Name	Use
:	Colon	To show the start of a list or to show important information.
;	Semi colon	To separate long items in a list or to join to simple sentences that are linked by meaning.

Grammar rules

Sentence construction:

All sentences need a subject, verb and an object.

Tense:

Past- Was/ Were
Present- Is/Am
Future- Will

Singular and Plural:

I was…
We/ they were….

Capital Letter Rules:

Start to a sentence.
Proper nouns.
Titles of books, films etc.
Days of the week.
Months of the year.
Religious deities.
I/ I'm/ I'd/ I've.
Historical periods/events.

Homophones

Their- belonging to them.
There- a position or place.
They're- contraction for they are.

Witch- a person with magic powers.
Which- a question word.

Were- past tense of was.
We're- contraction for we are.

Its- belonging to something.
It's- contraction for it is.

Toe- a part of the body.
Tow- to pull something along.

Hole- a hollow place in a solid body.
Whole- all of something.

English KS4 Curriculum 2025-2026

	Year 10			Year 11		
	Knowledge and skills	Cross Curricular	Enrichment	Knowledge and skills	Cross Curricular	Enrichment
Cycle 1	**Literature Paper 1-Macbeth** Read and explore key characters and themes. **Language Skills** Language analysis skills and writing techniques **Assessments:** **Mid- Cycle:** Macbeth extract **End:** Transactional Writing **Careers**- Stage manager/Director/ Actor/Speech writer/Journalist/ Marketing.	RE: Great Chain of Being and Christian beliefs. History: essay writing skills	RSC live showings	**Literature Paper 2** **Play: An Inspector Calls** Read and explore key characters and themes. **Unseen poetry** Analysis skills **Assessments:** November mock exams Language Paper 1, Literature Paper 2 **Careers**- Self-employed person/ Councillor/ shop worker.	Geo and Business: Economic world- links to economic ideas presented in the texts. History: similar time period	Theatre trip
Cycle 2	**Literature Paper 2-A Christmas Carol** Read and explore key characters and themes. Understanding of historical context. **Language Skills** Retrieval, analysis, evaluation, synthesis, and comparison. Writing skills. **Assessments:** **Mid-Cycle:** Theme of Redemption **End:** Paper 2 Language reading section **Careers**- Historian/ Charity worker.	Geography: The Living World and Nature poetry. History- poetry context.	Book club Carnegie shadowing Creative Writing competitions	**Revision and Consolidation** All sections of Literature and Language revisited and revised as appropriate for specific classes.		Book club Carnegie shadowing
Cycle 3	**Literature Paper 1-Poetry Anthology** Read and explore key themes and contextual information. **Language Skills** Retrieval, analysis, evaluation, synthesis, and comparison. Writing skills. **Assessments:** **Mid-cycle:** Poetry essay **End of cycle: Exams:** Literature Paper 1, Language Paper 2 **Careers**- Author/ Poet/English teacher/ Editor/ Librarian.	Extended writing skills: History MFL		**Revision/ Exams** All sections of Literature and Language revisited and revised as appropriate for specific classes.		

Year 10 – Cycle 3 – English Literature – A Christmas Carol		
Characters	**Plot Summary**	**Themes**
Ebenezer Scrooge - A miserable, selfish old man who hates Christmas. After a visit from four ghosts, he changes for the better. **Fred -** Scrooge's nephew. He is cheerful and full of Christmas spirit. **Bob Cratchit -** A poor, religious family man who works as a clerk for Scrooge. He is treated poorly and not given fair pay. He represents the poor. **Tiny Tim -** Bob's youngest son. He is ill and walks with a crutch. He has a positive outlook on life and is grateful. **Jacob Marley -** Scrooge's business partner who died seven years before the novella opens. He is punished for his crimes in life and returns as a ghost to Scrooge, preventing him from suffering the same fate he did. **The Ghost of Christmas Past -**The first ghost after Marley, it shows Scrooge a range of Christmases from his past. **The Ghost of Christmas Present -** The next ghost Scrooge meets who shows him a range of people, including the Cratchits and Fred celebrating Christmas. **The Ghost of Christmas Yet to Come -** The final ghost Scrooge sees who shows him the future that will occur if he doesn't change his ways.	**Stave 1**: Scrooge is described negatively at work where he neglects his workers, refuses to give money to charity, abuses carol singers and refuses to spend time with family. On leaving work, Scrooge sees (first on his knocker and then in his home) the ghost of Marley, his old, dead business partner. He warns him that he needs to change and tells him he will be haunted by three more ghosts. **Stave 2**: The first ghost arrives and takes Scrooge into his past. Firstly, he shows Scrooge himself as a lonely boy at school, with his sister who is trying to get him to come home for the holidays. He is then shown himself at a Christmas party at Fezziwig's (where he was apprenticed). The final vision the ghost presents, is that of his former fiancée Belle breaking off their engagement and then her happy with her new husband and family. **Stave 3**: The second ghost arrives- he is friendly giant who lives wholly in the present. First, he shows Scrooge the city and its inhabitants getting ready for Christmas before taking him to the Cratchits. They, despite being poor and having a meagre feast and an ill child, are happy and enjoying each other's company. Next the ghost takes him to his nephew Fred's house, where games are taking place - one of these is at Scrooge's expense. Finally, he shows him two unkempt children who represent Ignorance and Want. **Stave 4**: The final ghost is dressed in black and doesn't speak to Scrooge at all, which increases his fear. He shows him people discussing a dead man - they are not upset and seem quite pleased he's gone; people have stolen from him and taken his possessions to a pawn broker. He is also shown a family in his debt celebrating his death. Scrooge is then shown the Cratchits who are subdued following the death of Tiny Tim. Scrooge is suspicious the dead man is him and this is confirmed by the last thing the spirit shows him - a gravestone with his name on it. **Stave 5:** Scrooge wakes at home on Christmas morning - he is cheerful and pleased he hasn't missed Christmas. First, he sends the Cratchits a turkey for the day. He is pleasant to all: wishes people Merry Christmas, gives the charity collectors a good sum of money, visits Fred and buys presents for all. The following day, he gives Bob a pay rise and becomes 'a second father' to Tiny Tim.	**Family -** Scrooge is rich but miserable and the Cratchits are poor but content as a family. **The Christmas Spirit -** Christmas is a time of generosity and kindness. It is even powerful enough to transform Scrooge. **Change/Redemption -** Scrooge is redeemed by the end of novel. He becomes a better person and others have better lives as a result. **Social Responsibility -** Highlights the lack of responsibility the rich felt for the poor and the differences between them. **Social Class -** The characters in different social classes are treated differently throughout the novel and the opportunities they have. **Time and Place -** Set in London but goes to different places and times with the ghosts. **Poverty and Wealth -** The poor are presented as characters we should be sympathetic with and the rich as ignorant and uncaring.

Subject terminology	Context	Key Quotations
Pathetic Fallacy - using the weather or setting to mirror the feelings of characters. **Foreshadowing -** giving clues in a text about something that will happen later. **Symbolism -** the use of items or symbols to represent bigger ideas. **Allusion -** an indirect or passing reference to another piece of text. **Metaphor -** comparing one thing with another by saying it is something that it is not. **Simile -** comparing one thing to another by using the words 'like' or 'as'. **Cyclical structure -** the novel ends in the same place as it starts. **<u>Key Words</u>** **Miser -** a person who doesn't like to part with their money. **Avaricious -** someone who is obsessed with money. **Redemption -** the act of changing for the better. **Phantom -** ghost. **Workhouse -** a place the poor were sent to work and live when they were financially unable to support themselves. The conditions were often poor. **Pawnbroker -** a place where you sell items for money which can be bought back a later stage for an increased price	**Biographical:** Written by Charles Dickens in 1843 and set in London. Dickens was from a poor family and often commented on Victorian England in his novels. His father was sent to debtor's prison when he was 12 and so he had first-hand experience of the institutions. **Society:** In Victorian England there was a big divide between rich and poor - many of the poor in London couldn't afford to live or take care of their families. Living conditions for the poor were unhygienic and the NHS did not exist, which meant child mortality rates were high. Life expectancy was only about 40, although increasing and many people died of diseases. Family was the centre of people's lives and the average family had 5-6 children due to increasing birth rates and the need to bring money in. The majority of society in Britain was still very religious and practicing Christians, although many believed in ghosts and therefore loved ghost stories. Some businessmen (like Mr Cadbury) provided entire villages for their workers to ensure they were kept well and have a good quality of life. Many treated their workers badly and with a lack of respect. Britain had no NHS or benefits system to help those less fortunate in society.	'Are there no prisons? Are there no workhouses?' (Scrooge, S1) 'Bah! Humbug!' (Scrooge, S1) 'As solitary as an oyster.' (S1) 'A solitary child neglected by his friends.' (S2) 'I should like to be able to say a word or two to my clerk just now!' (Scrooge S2) 'Another idol has displaced me.' (Belle, S2) 'There never was such a goose!' (Bob, S3) 'I pity him.' (Fred, S3) 'This boy is Ignorance. This girl is Want.' (S3) 'It's likely to be a cheap funeral...' (S4) 'Quiet, very quiet the noisy little Cratchits.'(S4) 'I am not the man I was.' (Scrooge, S4) 'Scrooge was better than his word.' (S5) 'Therefore, I am about to raise your salary.' (Scrooge, S5) 'As so, as Tiny Tim observed, God Bless us everyone!' (S5) **My Own Key Quotations:**

All Saints' Academy Mathematics KS4 Curriculum

Cycle	Year 10 Foundation	Year 10 Higher	Year 11	
	Knowledge & Skills	Knowledge & Skills	Knowledge & Skills	
1	**Algebra:** • Laws of Indices • Multiplying linear expressions • Factorising Quadratic Expressions • Changing the subject **Number:** • Standard Form • Error Intervals • Compound Growth and Decay **Construction:** • Perpendicular bisector of a line • Angle bisector • Shortest distance from point to a line **Proportion:** • Simplifying ratios and sharing ratios • Best buys	**Algebra:** • Laws of Indices • Multiplying linear expressions • Factorising Quadratic Expressions • Changing the subject **Number:** • Standard Form • Indices and Surds • Error Intervals • Compound growth and decay **Geometry:** • Pythagoras' Theorem and 3D shapes • Fractional and negative enlargements • Similar Shapes and Triangles • Area and Volume Scale Factor **Construction:** • Perpendicular bisector of a line • Angle bisector • Shortest distance from point to a line **Proportion:** • Simplifying ratios and sharing ratios • Best buys • Connected Ratios	<u>Foundation</u> • Revision and preparation for mocks	<u>Higher</u> • Circle Theorems • Quadratic Inequalities • Sine and Cosine Rule • Revision and preparation for mocks
Careers	**Quantity Surveyor**	**Meterologist**	**College options needing Mathematics**	**University options with Mathematics**
2	**Geometry:** • Area of rectilinear shapes, triangles and circles • Sector perimeter and area • Area of compound shapes • Surface Area and Volume of Prisms • Pythagoras' Theorem	**Geometry:** • Spheres, pyramids, cones, frustums and composite solids • Sector perimeter and area • Area of compound shapes **Algebra:** • Algebraic fractions • Constant of proportionality	Revision and preparation for mocks	

	Algebra: • nth term of linear sequences • Straight Line graphs • Simultaneous Equations **Data Handling:** • Scatter graphs and Line of Best Fit • averages from tables and grouped intervals	• Straight line graphs • Linear and quadratic sequences • Simple Geometric progressions. • Linear inequalities and inequality regions • Simultaneous Equations – Linear, Quadratic and Circle Equations as one of the equations	
Careers	**CAD Technician**	**Acoustic Consultant**	
3	**Probability:** • Product Rule for Counting • Two-way tables • Venn Diagrams • Tree Diagrams and Conditional Probability **Geometry:** • Angles in Polygons • Trigonometry **Algebra:** • Solving Quadratic Equations algebraically and from their graphs	**Algebra:** • Quadratic, cubic, exponential and reciprocal graphs • Tangent to a circle • Completing the Square • Solving Quadratic Equations algebraically and from their graphs **Probability:** • Product Rule for Counting • Two-way tables • Venn Diagrams • Tree Diagrams and Conditional Probability **Geometry:** • Angles in Polygons • Trigonometry • Vectors **Statistics:** • Cumulative frequency graphs & box plots • Histograms.	Revision and preparation for final examinations.
Careers	**Sports Science and Analysis**	**Statistician**	

Year 10 Higher Cycle 2 Mathematics

LO: simplify algebraic fractions

Simplify

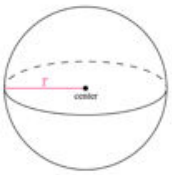
$$\frac{2x+8}{4}$$

$$\frac{2x+8}{4} = \frac{2(x+4)}{4}$$

$$= \frac{x+4}{2}$$

LO: apply the formula for the volume of a sphere and cone

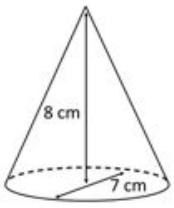
Sphere



$V = \frac{4}{3}\pi r^3$

$SA = 4\pi r^2$

What is the volume of this cone?



$V = \frac{1}{3}\pi r^2 h$

= 103 cm^3

Simplify

$$\frac{x+5}{2x+10}$$

$$\frac{x+5}{2x+10} = \frac{x+5}{2(x+5)}$$

$$= \frac{1}{2}$$

LO: draw and shade inequality regions

Simplify $\frac{x^2 + 5x + 4}{x^2 + 8x + 16}$

$= \frac{(x+1)(x+4)}{(x+4)(x+4)}$

LO: find the formula for the nth term of a quadratic sequence

The nth term of a quadratic sequence
A summary reminder diagram

The nth term is $an^2 + bn + c$

a + b + c = 5, 18, 35, 56, 81, 110, ...

3a + b = 13 17 21 25 29 ...

2a = 4 4 4 4 ...

Find the first and second differences of the black sequence (shown in red and blue respectively).
Find the value of a from the equation 2a = 4
Now work out the value of b from the equation 3a + b = 13 (you already know a)
Now work out the value of c from the equation a + b + c = 5 (you already know a and b)
The answer is $2n^2 + 7n - 4$

Year 10 Higher Cycle 2 Mathematics

LO: convert recurring decimals to fractions

Recurring Decimals to Fractions

1. Let x = recurring decimal.
2. Let n = the number of recurring digits.
3. Multiply the recurring decimal by 10^n.
4. Subtract (1) from (3) to eliminate the recurring part.
5. Solve for x, expressing your answer as a fraction in its simplest form.

Examples:

0.7 (one recurring digit)

$x = 0.7777...$

$10x = 7.777...$

$10x - x = 7$

$9x = 7$

$x = \frac{7}{9}$

1.256 (two recurring digits)

$x = 1.25656...$

$100x = 125.6565...$

$100x - x = 125.6565... - 1.256565...$

$99x = 124.4$

$x = \frac{124.4}{99} = \frac{1244}{990} = \frac{622}{495}$

LO: recognise inverse proportion problems

① Write an equation of proportionality.
② Substitute x & y to find k.
③ Rewrite the equation using k and substitute x to find y.

① $y = \frac{k}{x}$

5 workers can dig a well in 6 hours.

How long does it take 2 people?

$y = time$

② $6 = \frac{k}{5}$ (hours, workers)

$30 = k$ worker-hours

③ $y = \frac{k}{x}$

$y = \frac{30}{2}$

$y = 15$ hours

LO: find compound interest from the formula

£5000 in invested with an interest rate of 9.2% for two years. What is the value of the investment after 2 years?

Using the formula for compound interest,

$$A = P\left(1 + \frac{r}{100}\right)^n$$

$$= 5000\left(1 + \frac{9.2}{100}\right)^2$$

$$= 5000(1.092)^2$$

$$A = 5\,962.32$$

LO: solve simultaneous equations with one non-linear equation

Solve the simultaneous equations

$y = 3x + 1$

$y^2 = 4x^2 - x + 7$

$(3x+1)^2 = 4x^2 - x + 7$

$9x^2 + 6x + 1 = 4x^2 - x + 7$

$5x^2 + 7x - 6 = 0$

$5x^2 - 3x + 10x - 6 = 0$

$x(5x-3) + 2(5x-3) = 0$

$(5x-3)(x+2) = 0$

$5x - 3 = 0$ $\quad x + 2 = 0$

$5x = 3$ $\quad x = -2$

$x = \frac{3}{5}$

LO: factorise quadratic expressions

Factorise this quadratic

$$x^2 + 10x - 24$$

A $(x+4)(x+6)$

B $(x+2)(x-12)$

C $(x-6)(x-4)$

D $(x-2)(x-12)$

E $(x-6)(x+4)$

F $(x-2)(x+12)$

Which is the correct answer?

LO: factorise quadratic expressions where a > 1

$6x^2 + 3x - 8x - 4$

$= (6x^2 + 3x) + (-8x - 4)$ Group terms

$= 3x(2x + 1) + (-4)(2x + 1)$ Factor out GCFs

$= 3x(2x + 1) - 4(2x + 1)$ Simplify

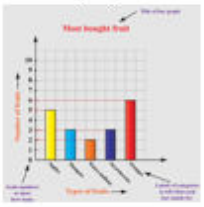
$= 3x(2x + 1) - 4(2x + 1)$ Common factor!

$= (2x + 1)(3x - 4)$ Factor out $2x + 1$

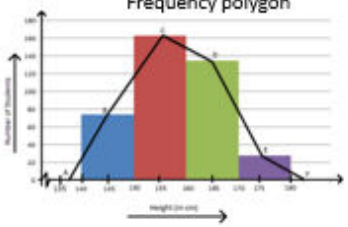
Year 10 Foundation Cycle 2 Mathematics

LO: I can represent, interpret and manipulate data including: Bar and bar line graphs, pictograms, frequency polygons, scatter graphs and line of best fit.

Bar graph

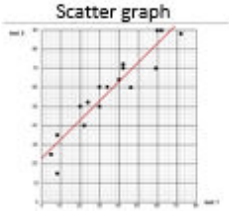


Frequency polygon



pictogram

Scatter graph



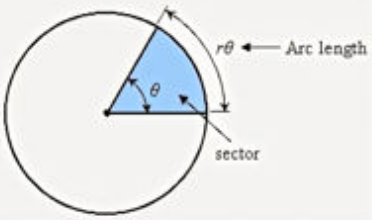
Hegarty 425,426,441,453,454

LO: I know the circle definitions and properties including: tangent, arc, sector and segment.
I can calculate the arc length of a sector and sector area.

θ is measured in **radians**

Arc length $= r\theta$

Area of sector $= \frac{1}{2}r^2\theta$



Hegarty 544-547

LO: I can work out averages and range including from frequency tables.

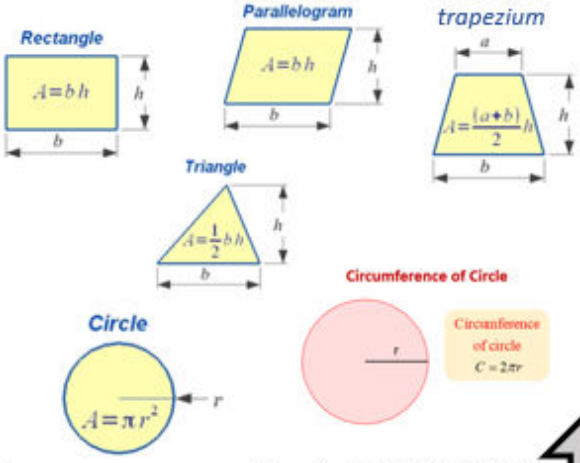
Mean = the sum of the numbers divided by the number of numbers in the data set
Median = middle number when ordered smallest to largest
Mode = number that appears the most often
Range = highest number takeaway smallest number

Minutes Late, t	Frequency, f	Midpoint, x	fx
$0 < t \leq 10$	27	5	135
$10 < t \leq 20$	10	15	150
$20 < t \leq 30$	7	25	
$30 < t \leq 40$	5	35	
$40 < t \leq 50$	4		
$50 < t \leq 60$	2	55	110
Total	55	Total	

Fill in the gaps
Can you work out the mean from the table? What about the median?

Hegarty 402-418

LO: I can calculate areas and perimeters of rectilinear shapes, triangles and circles.



Hegarty 536-543, 548-559

LO: I can do all 4 operations with decimals

Always align your decimals when adding or subtracting

Example
Evaluate 7.4 + 182.38 = 189.78

182.38
+007.40
189.78

Can you do 5.6-2.95?

Evaluate 3.6 x 2.4 = 8.64
36 x 24 = 864

36
x 24
24
120
120
-600
864

Evaluate 5.62 ÷ 0.2

5.62 ×10 / 0.2 ×10 = 56.2 / 2 → 28.1

= 28.1

2 | 56.2 → 28.1

Now can you try:

a) 2.4 x 12.1
b) 0.915 ÷ 0.3

Hegarty 47-51

LO: I can estimate calculations by rounding to 1s.f.

Estimate $\frac{315 \times 19}{9.8}$

First round all values to 1 s.f. before calculating.

$\approx \frac{300 \times 20}{10} \approx \frac{6000}{10} \approx 600$

Now can you try estimate these:

a) 3.21×68.5
b) $\frac{534 \times 4.8}{2.31}$

Hegarty 130 and 131

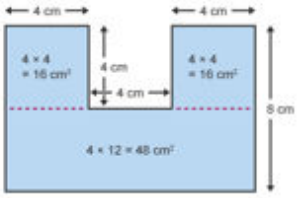
Year 10 Foundation Cycle 2 Mathematics

LO: I can calculate areas of compound shapes ☐

Method 1

Divide the shape into squares and rectangles, find their individual areas and then add them together.

The length of the larger rectangle is $4 + 4 + 4 = 12\ cm$



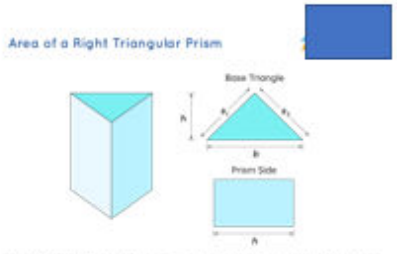
$Area = 16 + 16 + 48 = 80\ cm^2$

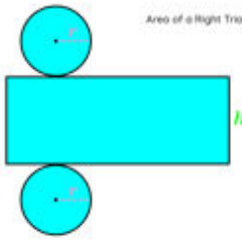
Method 2

Imagine the shape as a large rectangle with a section cut out.

Hegarty 555

LO: I can calculate the surface area of a right prisms and cylinders. ☐





Surface area of cylinder (SA)

$SA = 2\pi rh + 2\pi r^2$

$r = radius$ $h = height$

Hegarty 584-586

LO: I can find the nth term of a linear sequence. ☐

I can understand and recognise 'special sequences' including square, cube and Fibonacci. ☐

Find an expression for nth term for the following sequence

-1 ← 2, 5, 8, 11, 14

+3 +3 +3 +3

It goes up in 3 therefore the nth term starts with 3n

You then find the 0th term by finding out what comes before the 1st term.

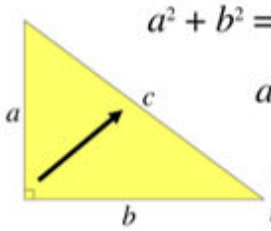
In this case -1

Therefore my nth term is: 3n - 1

Hegarty 198, 261, 263

LO: I can use Pythagoras' theorem in right angled triangles, as well as solve problems with Pythagoras' theorem in 2D figures. ☐

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



Which side is the hypotenuse?

The right angle points to the hypotenuse.

It's the side labelled "c".

Hegarty 498-504

LO: I can solve linear simultaneous equations by elimination and substitution, as well as derive and solve two simultaneous equations from a worded problem ☐

Solve the system by elimination.

$$\begin{cases} x + 2y = 11 \\ -3x + y = -5 \end{cases}$$

Step 1

$x + 2y = 11$

$-2(-3x + y = -5)$

$x + 2y = 11$

$+(6x - 2y = +10)$

$7x + 0 = 21$

Multiply each term in the second equation by –2 to get opposite y-coefficients.

Add the new equation to the first equation to eliminate y.

Step 2

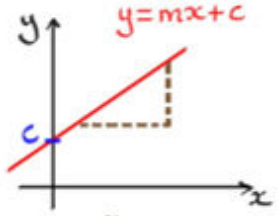
$7x = 21$

$x = 3$

Solve for x.

Hegarty 190-195

LO: I can find the equation of a line in the form of y=mx+c, as well as understand and interpret the gradient and y-intercept of straight line graphs, including parallel lines. ☐



m = gradient = $\frac{\text{difference in } y}{\text{difference in } x}$

Hegarty 206-214

KS4 Science Curriculum 2025-26

	Year 10		Year 11	
	Knowledge and skills	Curriculum links	Knowledge and skills	Curriculum links
Cycle 1	**Paper 1 content** **Biology** – Topic 1: Cell biology, and Topic 2: Organisation **Chemistry** – Topic 1: Atomic structure and the periodic table, and Topic 2: Bonding, structure, and the properties of matter **Physics** – Topic 1: Energy, and Topic 2: Electricity **Cycle 1 assessments:** Topics 1 and 2	Maths – throughout all topics. DT – links to digestion and food groups.	**Paper 2 content** **Biology** – Topic 6: Inheritance, variation and evolution **Chemistry** – Topic 7: Organic Chemistry, and Topic 8: Chemical analysis **Physics** – Topic 5: Forces (Forces and motion), and Topic 6: Waves (wave properties) **AUTUMN MOCKS: Paper 1 content** (combined or separate science content, dependent on set) Bio – Topics 1-4 Chem – Topics 1-5 Phys – Topics 1-4	Maths – throughout all topics. Interpreting graphs. RE – Evolution.
Cycle 2	**Paper 1 content** **Biology** – Topic 3: Infection and response, and Topic 4: Bioenergetics **Chemistry** – Topic 3: Quantitative chemistry, Topic 4: Chemical changes, and Topic 5: Energy changes **Physics** – Topic 3: Particle model of matter, and Topic 4: Atomic structure **Cycle 3 assessments:** Topics 3 and 4	Maths – throughout all topics. Recognising patterns. Reading and drawing graphs. PE – movement, circulation, link to fitness RSE – Personal health, healthcare.	**Paper 2 content** **Biology** – Topic 7: Ecology **Chemistry** – Topic 9: Chemistry of the atmosphere, and Topic 10: Using resources **Physics** – Topic 5: Waves (Electromagnetic waves), Topic 7: Magnetism and electromagnetism, and Topic 8: Space physics (separate sciences only) **SPRING MOCKS: Paper 2 content** (combined or separate science content, dependent on set) Bio – Topics 5-7, Chem – Topics 6-10, Phys – Topics 5-7 (combined) or Topics 5-8 (separate)	Maths – throughout all topics. Geography – links to sustainability. RE – The Big Bang Theory.
Cycle 3	**Paper 2 content** **Biology** – Topic 5: Homeostasis and response **Chemistry** – Topic 6: The rate and extent of chemical change **Physics** – Topic 5: Forces pt.1 **END OF YEAR 10 MOCKS: Paper 1 (combined sciences) content** Bio – Topics 1-4, Chem – Topics 1-5, Phys – Topics 1-4	Maths – throughout all topics. Using equations. Interpreting and drawing graphs. RSE – Health, human reproduction and contraception.	**Consolidate and revise** Papers 1 & 2 – identify areas to improve, revision, exam technique **GCSE exams:** **Combined science:** 2x 1h 15 min paper/science **Separate sciences:** 2x 1h 45 min paper/science	

AQA

Biology – Biology Paper 1- Infection and response

All Saints' Academy Dunstable

Communicable diseases

Pathogens are microorganisms that cause infectious disease

Viruses live and reproduce inside cells causing damage

Bacteria may produce toxins that damage tissues and make us fell ill

Pathogens may infect plants or animals and can be spread by direct contact, water or air

Viral diseases

Disease	Symptoms	Method of transmission	Control of spread
Measles	Fever, red skin rash.	Droplet infection from sneezes and coughs.	Vaccination as a child.
HIV	Initially flu like systems, serious damage to immune system.	Sexual contact and exchange of body fluids.	Anti-retroviral drugs and use of condoms.
TMV	Mosaic pattern on leaves.	Enters via wounds in epidermis caused by pests.	Remove infected leaves and control pests that damage the leaves.

Bacterial diseases

Disease	Symptoms	Method of transmission	Control of spread
Salmonella	Fever, cramp, vomiting, diarrhoea.	Food prepared in unhygienic conditions or not cooked properly.	Improve food hygiene, wash hands, vaccinate poultry, cook food thoroughly.
Gonorrhoea	Green discharge from penis or vagina.	Direct sexual contact or exchange of body fluids.	Use condoms. Treatment using antibiotics.

Fungal and Protist diseases

Disease	Symptoms	Method of transmission	Control of spread
Malaria (Protists)	Recurrent fever.	By an animal vector (mosquitoes).	Prevent breeding of mosquitoes. Use of nets to prevent bites.
Rose black spot (Fungus)	Purple black spots on leaves.	Spores carried via wind or water.	Remove infected leaves. Spray with fungicide.

Human defences-Non specific defence

Nose	Nasal hairs, sticky mucus and cilia prevent pathogens entering through the nostrils.
Trachea and bronchus (respiratory system)	Lined with mucus to trap dust and pathogens. Cilia move the mucus upwards to be swallowed.
Stomach acid	Stomach acid (pH1) kills most ingested pathogens.
Skin	Hard to penetrate waterproof barrier. Glands secrete oil which kill microbes

Human defences-The immune system

White blood cells are part of the immune system

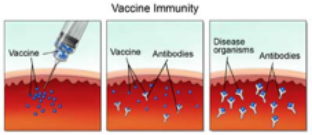
Pathogens are identified by white blood cells by the different proteins on their surfaces **ANTIGENS.**

Phagocytes	*Phagocytosis*	Phagocytes engulf the pathogens and digest them.
Lymphocytes	*Antibody production*	Specific antibodies destroy the pathogen. This takes time so an infection can occur. If a person is infected again by the same pathogen, the lymphocytes make antibodies much faster.
	Antitoxin production	Antitoxin is a type of antibody produced to counteract the toxins produced by bacteria.

Vaccinations

Used to immunise a large proportion of the population to prevent the spread of a pathogen

Small amount of dead or inactive form of the pathogen	*1st infection by pathogen*	White blood cells detect pathogens in the vaccine. Antibodies are released into the blood.
	Re-infection by the same pathogen	White blood cells detect pathogens. Antibodies are made much faster and in larger amounts.



Antibiotics and Painkillers

antibiotics	*e.g. penicillin*	Kill infective bacteria inside the body. Specific bacterial infections require specific antibiotics.
Painkillers and other medicines	*e.g. aspirin, paracetamol, ibuprofen*	Drugs that are used to treat the symptoms of a disease. They do not kill pathogens

Antibiotics cannot be use to treat viral pathogens

It is difficult to develop drugs to kill viruses without harming body tissues because viruses live and reproduce inside cells

Antibiotics have greatly reduced deaths from infectious bacterial disease

Bacteria can mutate- Sometimes this makes them resistant to antibiotic drugs.

Drugs

Drugs have to be tested and trialled before to check they are safe and effective

New drugs are extensively tested for:	*Efficacy*	Make sure the drug works
	Toxicity	Check that the drug is not poisonous
	Dose	The most suitable amount to take

Preclinical trials - using cells, tissues and live animals - must be carried out before the drug can be tested on humans.

Clinical trials use healthy volunteers and patients

- Very low doses of the drug are given at the start of the clinical trial.
- If the drug is found to be safe, further clinical trials are carried out to find the optimum dose for the drug.
- In double blind trials, some patients are given a placebo.

My Biology teacher is:

Biology – Knowledge Organiser
Biology Paper 1- Bioenergetics

Photosynthesis

The plant manufactures glucose from carbon dioxide and water using energy transferred from the environment to the chloroplasts by light.

Photosynthesis

$6CO_2 + 6H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6 + 6O_2$

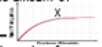
Carbon Dioxide + Water $\xrightarrow[\text{Chlorophyll}]{\text{Sunlight}}$ Glucose + Oxygen

Uses of glucose from photosynthesis

The glucose produced in photosynthesis may be:
- used for respiration
- converted into insoluble starch for storage
- used to produce fat or oil for storage
- used to produce cellulose, which strengthens the cell wall
- used to produce amino acids for protein synthesis.

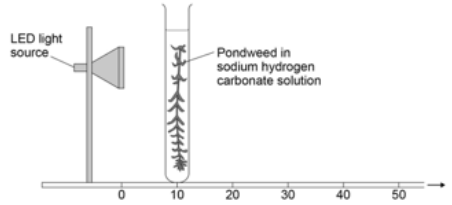
To produce proteins, plants also use nitrate ions that are absorbed from the soil.

Rate of photosynthesis

Factor	How the rate is affected	Limiting factors
Temperature	*As the temperature of the environment the plant is in increases rate of photosynthesis increases (up to a point) as there is more energy for the chemical reaction.*	Photosynthesis is an enzyme controlled reaction. If the temperature increases too much, then the enzymes become denatured and the rate of reaction will decrease and stop
Light intensity	*Light intensity increases as the distance between the plant and the light sources increases. As light intensity increases so does the rate of photosynthesis (up to a point) as more energy is available for the chemical reaction.*	At point X another factor is limiting the rate of photosynthesis. This could be carbon dioxide concentration, temperature or the amount of chlorophyll 
Carbon dioxide concentration	*Carbon dioxide is needed for plants to make glucose. The rate of photosynthesis will increase when a plant is given higher concentrations of carbon dioxide (up to a point).*	At point X another factor is limiting the rate of photosynthesis. This could be light intensity, temperature or the amount of chlorophyll 
Amount of chlorophyll	*Chlorophyll is a photosynthetic pigment that absorbs light and allows the reaction between water and carbon dioxide to occur (photosynthesis)*	Another factor could limit the rate of photosynthesis. This could be light intensity, temperature or the carbon dioxide concentration

Required practical-investigating photosynthesis

The rate of photosynthesis is affected by many factors, such as:
- light intensity
- light wavelength.

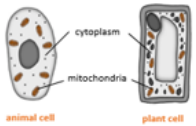


Respiration

Cellular respiration is an exothermic reaction which is continuously occurring in living cells.

The energy transferred supplies all the energy needed for living processes.

Organisms need energy for:
- chemical reactions to build larger molecules
- movement
- keeping warm.



Aerobic respiration

Respiration with oxygen. Occurs inside the mitochondria continuously.

Glucose + Oxygen → Carbon dioxide + Water

$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

Anaerobic respiration

Respiration when oxygen is in short supply. Occurs during intensive exercise. Glucose → Lactic acid

During hard exercise, muscle cells are respiring so fast that blood cannot transport enough oxygen to meet their needs.

Glucose is partially oxidised to produce **lactic acid** which builds up in muscle tissue causing them to become painful and fatigued.

As the **oxidation of glucose is incomplete** in **anaerobic respiration** much **less energy** is transferred than in aerobic respiration.

Anaerobic respiration in **yeast cells** is called **fermentation** and has economic importance in the **manufacture of bread and alcoholic drinks.**

Glucose → Ethanol + Carbon dioxide

Response to exercise

During long periods of vigorous activity muscles become fatigued and stop contracting efficiently.

During exercise the human body reacts to increased demand for energy	*Heart rate increases*	Top pump oxygenated blood faster to the muscle tissues and cells.
	Breathing rate and breath volume increase	This increases the amount of oxygen entering the blood stream.

Metabolism

Metabolism is the sum of all the reactions in a cell or the body.

The energy transferred by respiration in cells is used by the organism for the continual enzyme controlled processes of metabolism.	Conversion of glucose to starch, glycogen and cellulose.
	The formation of lipid molecules from a molecule of glycerol and three molecules of fatty acid.
	The use of glucose and nitrate ions to form amino acids which in turn are used to synthesise proteins.
	Respiration
	Breakdown of excess proteins to form urea for excretion.

My Biology teacher is:

AQA

Chemistry
Chemistry Paper 1- Quantitative Chemistry

All Saints' Academy Dunstable

Key terms

1 Law of conservation of mass	**No atoms** are **lost** or **gained** during a **chemical reaction**. The mass of the products is the same as the mass of the reactants. Some reactions **appear to give a change in mass**, but this is because a **gas may have escaped** from the reaction container.
2 Relative atomic mass (A_r)	The **average mass** of an **atom of an element** compared to Carbon-12.
3 Relative formula mass (M_r)	The **sum** of **all the atomic masses** of the atoms in a **formula** (e.g. H_2O).
4 Uncertainty	The **interval** within which the **true value** can be **expected to lie**. E.g. 25°C ± 2°C – the true value lies between 23°C and 27°C.
5 Mole (HT)	A measurement for the amount of a chemical. It is the **mass** (in grams) of **6.02×10^{23}** (the Avogadro constant) **atoms of an element**. Symbol: mol.
6 Balanced equation (HT)	Balanced symbol equations show **the number of moles that react**. e.g. $Mg + 2HCl \rightarrow MgCl_2 + H_2$ Shows one mole of magnesium reacting with two moles of hydrochloric acid to form one mole of magnesium chloride and one mole of hydrogen.
7 Limiting reactant (HT)	The **reactant** that is **completely used up** in a chemical reaction. It **limits the amount of product** formed.
8 Excess reactant (HT)	The reactant that is **not completely used up** in a chemical reaction. There is some reactant left at the end.
9 Concentration	A measure of the **number of particles** of a chemical in a **volume**. Can be measured in **g/dm³**.
10 Decimetre³ (dm^3)	A **measurement of volume**. Contains **1000cm³**.

Calculating relative formula mass (M_r)

Add up all the atomic masses in a formula.

e.g. H_2O. Mass of hydrogen = 1. Mass of oxygen = 16.

$(2 \times 1) + 16 = 18$

Percentage uncertainty

$$\text{Percentage uncertainty} = \frac{\text{Uncertainty}}{\text{Quantity being measured}} \times 100$$

e.g. What is the percentage uncertainty of a 50cm³ measuring cylinder accurate to ±2cm³?

$$\text{Percentage uncertainty} = \frac{2}{50} \times 100 = 4\%$$

Number of moles

$$\text{Number of moles} = \frac{\text{Mass of chemical}}{\text{Relative formula mass}}$$

e.g. How many moles of water are there in 36g of H_2O?

$$\text{Number of moles} = \frac{36}{18} = 2 \text{ moles}$$

Volume in dm³

$$\text{Volume in dm}^3 = \frac{\text{volume of liquid}}{1000\text{cm}^3}$$

e.g. What is the volume in dm³ of 500cm³ of hydrochloric acid?

$$\text{Volume in dm}^3 = \frac{500}{1000} = 0.5\text{dm}^3$$

Concentration of a solution

$$\text{Concentration} = \frac{\text{Mass of solute}}{\text{Volume (in dm}^3\text{)}}$$

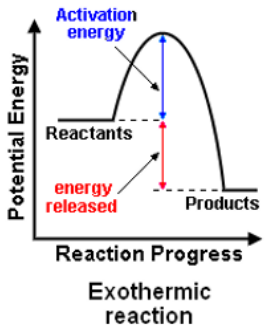
e.g. What is the concentration of a solution of hydrochloric acid which contains 100g of hydrochloric acid in 500cm³?

$$\text{Concentration} = \frac{100}{0.5} = 200\text{g/dm}^3$$

My Chemistry teacher is

Chemistry
Chemistry Paper 1- Energy changes

Exothermic reactions

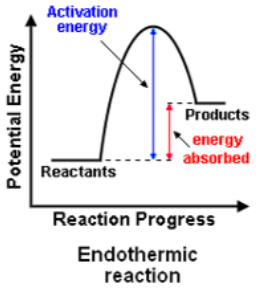


A reaction that **transfers energy to the surroundings** so the **temperature of the surroundings increases**, e.g. **combustion** and **neutralisation** reactions.

Used in **self-heating cans** and **hand warmers**.

Activation energy= The minimum **energy needed** for **particles to successfully react.**

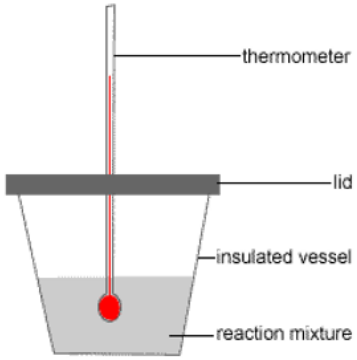
Endothermic reactions



A reaction that **takes in energy from the surroundings** so the **temperature of the surroundings decreases**, e.g. **thermal decomposition**.

Used in **sports injury packs.**

Required practical- Investigate the variables that affect temperature change in chemical reactions eg acid plus alkali.



Energy change of a reaction (Higher tier)

Energy is **not created or destroyed**, only **transferred from one store to another**. This is known as the **conservation of energy**.

Energy is needed to break bonds.

Energy is released when bonds are formed.

If the energy change is **positive** then the reaction is **endothermic**. If the energy change is **positive** then the reaction is **exothermic**.

The energy change in a reaction can be calculated using **bond energies**. A bond energy is the amount of **energy** needed to break one **mole** of a particular **covalent bond**.
Different bonds have different bond energies. These are given when they are needed for calculations.

To calculate an energy change for a reaction:
•add together the bond energies for all the bonds in the **reactants**- this is the 'energy in'
•add together the bond energies for all the bonds in the **products** - this is the 'energy out'
•energy change = energy in - energy out

Hydrogen and chlorine react to form hydrogen chloride gas:

$H–H + Cl–Cl \rightarrow 2 \times (H–Cl)$

Use the bond energies in the table to calculate the energy change for this reaction.

Bond	Bond energy
H–H	436 kJ mol^{-1}
Cl–Cl	243 kJ mol^{-1}
H–Cl	432 kJ mol^{-1}

Energy in = 436 + 243 = 679 kJ mol^{-1}

Energy out = (2 × 432) = 864 kJ mol^{-1}

Energy change = in - out

= 679 - 864

= -185 kJ mol^{-1}

My Chemistry teacher is:

AQA

Chemistry Paper 1- Chemical changes

Key terms:

Acid – Substance producing more hydrogen ions than hydroxide ions when dissolved in water.

Alkali – Substance producing more hydroxide ions than hydrogen ions when dissolved in water.

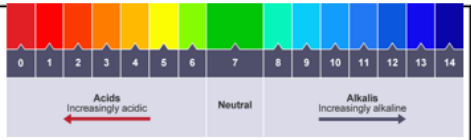
Base – A substance that reacts with an acid to neutralise it and produce a salt.

Neutralisation – The reaction between an acid and a base to form a salt plus water.

Oxidation – The gain of oxygen, or loss of electrons, by a substance during a chemical reaction

Reduction – When reduction and oxidation take place at the same time.

Acids and alkalis



- **Acids** form acidic solutions in water. Acids produce hydrogen ions, H^+ in aqueous solution
- **Alkalis** form alkaline solutions in water. Alkalis produce hydroxide ions, OH^- in aqueous solution.
- A **neutral** solution is neither acidic, nor alkaline. A neutral solution has a pH value of 7.
- The pH scale measures the acidity or alkalinity of a solution. The pH of a solution can be measured using a pH probe, or estimated using universal indicator and a colour chart.

Neutralisation

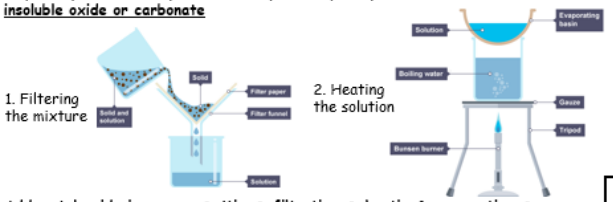
A **neutralisation** reaction is a reaction between an acid and a base.

acid + base → salt + water

Remember:
acids in solution are sources of hydrogen **ions**, H^+
alkalis in solution are sources of hydroxide ions, OH^-

$$H^+_{(aq)} + OH^-_{(aq)} \rightarrow H_2O_{(l)}$$

Required practical: Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate



Add metal oxide in excess → Mix → filtration → heating& evaporation → crystallisation

Reactivity Series

The **reactivity series** of metals is a chart showing metals in order of decreasing **reactivity**. In general, the more **reactive** a metal is:

- the more vigorous its reactions are
- the more easily it loses electrons in reactions to form positive ions (cations)

Metal	Reaction with cold water	Reaction with dilute acids	Reactivity
Potassium	Violent	Violent	Most reactive
Sodium			
Lithium			
Calcium	Fast	Rapid	
Magnesium	Very slow		
(Carbon)			
Zinc	Usually no reaction	Slow	
Iron	Rusts slowly		
(Hydrogen)			
Copper	No reaction	No reaction	Least reactive
Gold			

Reactions of metals with water
Metal + water → metal hydroxide + hydrogen
E.g. Sodium + water → sodium hydroxide + hydrogen

Reactions of metals with acids
Metal + acid → salt + hydrogen
E.g. Magnesium + hydrochloric acid → magnesium chloride + hydrogen

Extraction of metals and reduction

Unreactive metals such as gold are found in the Earth as the metal itself but most metals are found as compounds that require chemical reactions to extract the metal.

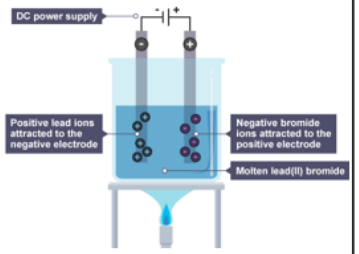
Metals less reactive than carbon can be extracted from their oxides by reduction with carbon. Reduction involves the loss of oxygen.

FORMATION OF METAL ORE:
Oxidation = Gain of Oxygen
E.g. magnesium is oxidised to make magnesium oxide.
$2Mg + O_2 \rightarrow 2MgO$

EXTRACTION OF METAL:
Reduction = Loss of Oxygen
E.g. copper oxide is reduced to copper.
$2CuO + C \rightarrow 2Cu + CO_2$

The position of the metal in the reactivity series determines whether it can be extracted with carbon.
Metals higher than carbon in the reactivity series have to be extracted using electrolysis.
Metals below carbon in the reactivity series can be extracted by reduction using carbon

Electrolysis



Products of electrolysis
When ions reach an electrode, they gain or lose electrons. As a result, they form atoms or molecules of elements:

- positive ions gain electrons from the negatively charged cathode
- negative ions lose electrons at the positively charged anode

Molten lead bromide, $PbBr_2(l)$, is an electrolyte. During electrolysis:

- Pb_2^+ ions gain electrons at the cathode and become Pb atoms
- Br^- ions lose electrons at the anode and become Br atoms, which pair up to form Br_2 molecules

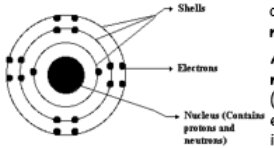
So lead forms at the negative electrode and bromine forms at the positive electrode.

My Chemistry teacher is:

Year 10 Physics – Cycle 2 – Paper 1- Atomic Structure

Atomic Structure

Atom= The **smallest part of an element** that can exist. All substances are made of atoms. **No** overall **electrical charge. Very small**, radius of 0.1nm.



Mass number – the total number of **protons** and **neutrons**

Atomic number – the **number of protons** (the number of electrons is the same in an atom)

$^{23}_{11}Na$

Electron configuration– Electrons fill the first energy level (shell) first. Maximum electrons: **2 in first shell 8 electrons in other shells**

Sub-atomic particle	Mass	Charge	Position in Atom
Proton	1	+1	Nucleus
Neutron	1	0	Nucleus
Electron	Very small	-1	Orbiting in shells

Atoms and Isotopes

Atoms of the same element can have **different numbers of neutrons**; these atoms are called **isotopes** of that element.

Atoms turn into **positive ions** if they **lose one or more outer electron(s)**.

Isotopes of Carbon

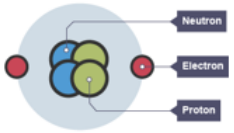
^{12}C	^{13}C	^{14}C
Carbon-12	Carbon-13	Carbon-14
6 protons 6 neutrons	6 protons 7 neutrons	6 protons 8 neutrons

Energy levels: Absorption of radiation may lead to electrons moving further from the nucleus (higher energy level). Emission of radiation may lead to electrons moving closer to the nucleus (lower energy level).

Development of the model of the atom

Plum pudding model

The plum pudding model shows that the atom is a **ball of positive charge** with **negative electrons embedded** in it. Was **incorrect**.



Nuclear model

Rutherford's scattering experiment found a **dense, positively charged nucleus.**

The nuclear model has a **positive nucleus** and **electrons orbiting.**

Chadwick later discovered **neutrons.**

Bohr discovered the arrangement of **electrons in shells.**

Nuclear radiation

Radioactive decay= When an **unstable nucleus changes** to **become more stable** and **gives out radiation. Random.**

Activity= The **rate at which decay occurs.** Measured in **becquerels (Bq).**

Count rate= Number of decays recorded **each second** by a Geiger-Muller tube.

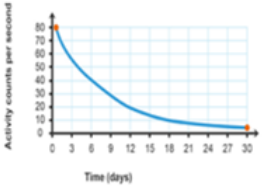
Radiation	Range in air	Absorbed by	Ionizing Power	Product emitted when nuclei decays
Alpha	Short – **up to 5cm**	**Paper** and **skin**	**Very High**	**2 protons** and **2 neutrons**
Beta	Medium – **about 1m**	About 5mm of **aluminium.**	**Medium**	**Electron**
Gamma	**Unlimited** – spreads out in air from the source	**Several centimetres** of **lead.**	**Low**	**Electromagnetic wave**

Nuclear equations

Alpha decay	$^{219}_{86}Rn \rightarrow {}^{215}_{84}Po + {}^{4}_{2}He$ In alpha decay a helium nucleus (2 protons and 2 neutrons) is emitted. The new element formed has: - A mass number that has decreased by 4. - An atomic number that has decreased by 2.
Beta decay	$^{14}_{6}C \rightarrow {}^{14}_{7}N + {}^{0}_{-1}e$ In beta decay a neutron turns into a proton. An electron is emitted. The new element formed has: - A mass number that stays the same. - An atomic number that increases by 1.
Gamma ray	There are no changes to the nucleus when gamma rays are emitted.

Half-life

The **time it takes** for the **number of nuclei of the isotope in a sample to halve**
Or,
The **time it takes for the count rate** (or activity) from a sample containing the isotope **to fall to half its initial level.**



Contamination

Contamination	The **unwanted presence of materials containing radioactive atoms** e.g. within liquids, with the body/ on the skin.
Irradiation	When an object is **exposed to radiation.** The object does not become radioactive itself.
Ionisation	Radiation can ionize by **removing electrons from atoms to form ions.** If this happens in **DNA** it could lead to a **mutation that causes cancer.**
Peer review	The **checking of scientific results** by other **scientific experts.**

Nuclear fission

Where an unstable **nucleus** absorbs a neutron, **splits** into two daughter **nuclei** releasing a lot of energy and more neutrons. Used in **nuclear power stations**

Nuclear fusion

Where two **nuclei** combine to produce a new, larger **nucleus.** Releases a lot of energy in the process. Requires high temperature and pressures, happens in **stars.**

My Physics teacher is:

Yr 10 Physics – Cycle 2 – Paper 2 - Forces

Key terms

Scalar quantity: A value with **magnitude (size) only**, e.g. **speed, distance.**

Vector quantity: A value with **magnitude (size)** and **direction**, e.g. **all forces, displacement, velocity.**

Contact forces: Force between objects that are **touching** e.g. friction, air resistance.

Non-contact forces: Force between **separate objects** e.g. gravitational force, magnetic force.

Resultant force: A resultant force is a **single force** that has the **same effect as all the forces** acting on an object.

Gravity and Weight

Weight is the **force of gravity** acting **on an object's mass.** Measured using a **newtonmeter**.

You must learn this equation and units.

Equation	Symbol equation	Units
Weight = mass x gravitational field strength	W = m g	Weight – newtons (N) Mass – kilograms (kg) GFS – newtons per kilogram (N/kg)

The weight of an object may be considered to act at a single point referred to as the object's 'centre of mass'.
The weight of an object and the mass of an object are directly proportional.

Work done

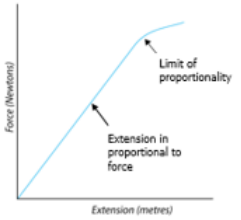
Work is done when an **object is moved through a distance.** When work is done **against friction** there is a **temperature rise.**

You must learn this equation and units.

Equation	Symbol equation	Units
Work done = force x distance	W = F s	Work done – joules (J) Force – newtons (N) Distance – metres (m)

Forces and elasticity

Elastic deformation	Occurs when a **spring is stretched** and can then **return to its original length.**
Inelastic deformation	Occurs when a **spring is stretched** and its **length is permanently altered.**
Limit of proportionality	The **length** a spring can be **stretched before it no longer is able to return to its original length.** Beyond the limit of proportionality, a force-extension graph is curved.



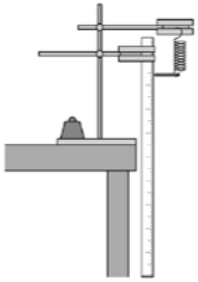
Force-extension graph

You must learn this equation and units.

Equation	Symbol equation	Units
Force = spring constant x extension	F = k e	Force – newtons (N) Spring constant – newtons per metre (N/m) Extension – metres (m)

Required practical-investigating the relationship between force and extension for a spring

https://www.youtube.com/watch?v=QQCIeAqBumE



- Hang different masses from a spring and measure the extension of the spring for each mass used
- Convert mass into weight
- Use your results to plot a graph of extension against weight.

My Physics teacher is:

KS4 Religious Studies Curriculum Plan 2025-26

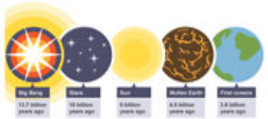
Staff	Year 10 - Edexcel	Year 11 – Edexcel
Careers	Building understanding of world views and philosophical and ethical approaches gives an understanding of how society functions. Leading to careers in the public sector, HR, Social policy design, law, environmental work, International development, working with NGO's etc. home work related tasks will be set at the end of every cycle that link to careers.	
Cycle 1 = 10 weeks	Paper 1 Religion and Society through a study of Christianity Christian Beliefs • The Trinity • The creation of the universe and humanity • The incarnation • The last days of Jesus' life • The nature of salvation • Christian eschatology • The problem of evil and suffering • Solutions to the problem of evil and suffering Matters of Life and Death • Origins and value of the universe • The sanctity of life • The origins and value of human life • The issue of abortion • Death and the afterlife • Non-religious arguments against life after death • Euthanasia • The natural world and issues raised	Intro Living the Muslim life – • The Ten obligatory acts in Shi'a Islam • The Shahadah • Salah • Sawm • Zakah and Khums • Hajj • Jihad • Celebrations and commemorations Intro Peace and Conflict – • Peace • Peace making • Conflict • Pacifism • The just war theory • Holy war • Weapons of mass destruction • Issues surrounding conflict
Assess Week - (1 week)	GCSE style assessment, based upon these topics. Assessment and mark scheme in shared area.	Mocks and GCSE style assessment, based upon these topics Assessment and mark scheme in shared area.
Review - (1 week)	Green pen against mark scheme, peer review then teacher assessment followed by consolidation of common misconceptions.	Green pen against mark scheme, peer review then teacher assessment followed by consolidation of common misconceptions.
Cycle 2 = 10 weeks	Intro Living the Christian life • Christian worship • Sacraments • The nature and purpose of prayer • Pilgrimage • Celebrations • The future of the Church • The Church in the local community • The worldwide Church Intro Marriage and the family – • Marriage • Sexual relationships • Families • Roles within the family • Family in the local parish	Revision Start revision for Mocks – Matters of life and death – Sanctity of life and associated teaching Cycle 2 –FULL MOCKS – Christian Beliefs and Practices, plus marriage and family revision Revision from the post mock point will be based upon weak areas from full mocks for each class, below is a suggested outline. This will be confirmed in Dept. meetings and agreed with HoF Cycle 2 - Structured Revision Start with Muslim Beliefs – 6 Beliefs and 5 Roots Allah and Prophets Holy books and Angels Al-Qadr and Aqirah Living the Muslim Life revision – The 10 obligatory Acts and Shahadah

	• The family in the parish today • Family planning Divorce • Men and women in the family • Gender prejudice and discrimination	Salah and Sawm Zakh and Khums – and Hajj Jihad and celebrations and festivals
Assess Week – (1 week)	GCSE style assessment, based upon this topic. Assessment and mark scheme in shared area.	GCSE style assessment, based upon this topic. Assessment and mark scheme in shared area.
Review – (1 week)	Green pen against mark scheme, peer review then teacher assessment followed by consolidation of common misconceptions.	Green pen against mark scheme, peer review then teacher assessment followed by consolidation of common misconceptions.
Cycle 3 = 10 weeks	Introduction to Paper 2 – Religion, Peace and Conflict through a study of Islam Muslim Beliefs – • The six beliefs of Islam • The five roots of "Usul ad-Don" in Shi'a Islam • The nature of Allah • Risalah • Malaikah • Muslim Holy books • Al-Qadr • Akhirah Intro Crime and punishment in Islam – • Justice • Crime • Good, evil and suffering • Punishment • Aims of punishment • Forgiveness • Treatment of criminals • The death penalty	
Assess Week – (1 week)	GCSE style assessment, based upon this topic. Assessment and mark scheme in shared area.	Assessment based upon Paper 1.
Review – (1 week)	Green pen against mark scheme, peer review then teacher assessment followed by consolidation of common misconceptions.	Green pen against mark scheme, peer review then teacher assessment followed by consolidation of common misconceptions.

Edexcel - Year 10 Religion and Ethics – Cycle 2 – Matters of life and death

Origins and value of the universe

Today, the idea now known as the Big Bang theory is the most accepted scientific explanation for how the universe came into being.



- Christianity teaches that the universe is important and is a reflection of God's great power and wisdom, known as general revelation.
- Many Christians believe that you can learn about God by studying the universe. This is known as natural theology.
- Christianity has been criticised in the past for encouraging a selfish and destructive attitude towards the environment. In response to this, the Christian Church has urged people to be better stewards of the Earth and the environment.

The Sanctity of life

- Christianity teaches that all life is special because it comes from God.
- Human life is believed to be particularly precious and is regarded as sacred.

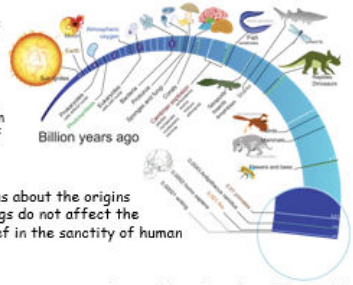
Before I formed you in the womb I knew you, before you were born I set you apart; I appointed you as a prophet to the nations. (Jeremiah 1:5)

- A belief in the sanctity of life can influence the way a Christian might try to live their life and their attitude towards bioethical issues associated with the beginning and end of life, such as abortion, embryo research, cloning, fertility treatments, genetic engineering and euthanasia.
- While all Christians may believe in the sanctity of life they can have different views about matters of life and death.

Origins and value of human life

Scientific theories argue that human beings were not created when the universe began billions of years ago but came into being much later through a process known as evolution.

- The theory of evolution was put forward by Charles Darwin in a book called On the Origins of Species.



- Scientific ideas about the origins of human beings do not affect the Christian belief in the sanctity of human life.
- Christians share a respect and regard for the value of human life with people from other religions and agnostics and atheists alike.
- The value of human beings is recognised in the Universal Declaration of Human Rights.

Abortion

Abortion is the medical process that terminates or ends a human pregnancy so that it does not result in the birth of a baby.

- Traditionally, the Christian Church has taught that abortion is wrong in all circumstances. Today, denominations have different views and for many Christians it is a very complex issue.
- Humanists believe that abortion is a serious moral issue. They support a woman's right to have an abortion, if that is the right choice for them, but believe that abortion should be a last resort. Atheists have differing views about abortion. Some atheists are very pro-life and totally against abortion, whereas others believe that it can be a positive moral choice. A Christian may or may not share the views of an atheist or Humanist about abortion, depending upon each of their personal beliefs. Most Christians would disagree with the idea that abortion can be a positive moral choice.

Death and the afterlife

People have different ideas about what happens after death. Christians believe that the resurrection of Jesus proves that life continues after death.

Theists and Humanists do not believe in life after death. They argue that death is the end of human existence and to think anything else is just 'wishful thinking'.

Christians reject all arguments that say there is no such thing as an afterlife. They are also taught to answer questions and explain their beliefs to the non-religious.

Some people claim to have had near death experiences, which they think supports the idea of an afterlife, although others disagree and say that this can be explained in other ways.

Euthanasia

Euthanasia is a term used to describe the deliberate act of ending a person's life to relieve pain and suffering. It is a complex issue and can also be known as assisted dying.

- Hospices and palliative care are seen as alternatives to euthanasia.
- Most Christians disagree with euthanasia and think it is morally wrong. This is because of a belief in the sanctity of life.
- Humanists and many atheists would like to see voluntary euthanasia legalised, under strict conditions. They believe that it is everyone's basic human right to be able to choose how and when they die.
- Christians do not want euthanasia to be legalised

Christian and non-religious responses to the natural world

Christians believe that stewardship is a way of life. This means they have a responsibility to try to protect and improve the environment.

Operation Noah is an ecumenical Christian charity which is very concerned about climate change. It says that the time has now come for everyone, particularly Christians, to take action against this.

In the past, Christianity has been criticised for its attitude towards animals. Today most Christians believe that animals are an important part of God's creation.

However, they have different ideas about the role of animals and, in some cases, how they should be treated. The Anglican Society for the Welfare of Animals (ASWA) is a Church of England organisation that supports animal welfare.

It also campaigns to stop the abuse of animals Organisation, which aims to educate people about the importance of caring for all of creation.

Exam questions

- Outline 3 arguments for life after death (3 Marks)
- Outline 3 reason for why a Christian might oppose abortion (3 Marks)
- Outline 3 arguments in support of euthanasia (3 marks)

- Explain two scientific explanations about the origins of human life. (4marks)
- Explain two reasons why a nonreligious person would reject belief in a life after death. (4 marks)
- Explain two different Christian beliefs about animal rights (5 marks)

- Explain two reasons why Christians believe in the existence of life after death. (5 marks)
- Explain two reasons why a Christian might oppose Euthanasia. (5 marks)
  - ➢ In your answer you must refer to a source of wisdom and authority

- 'Human life created itself' (12 marks)
- 'Abortion is always wrong' (12 Marks)
- 'There is no good reason to believe in an afterlife.'
  - ➢ Refer to Christian teachings
  - ➢ Refer to a different Christian point of view
  - ➢ Read a justified conclusion

Key terms

Big Bang
A scientific theory regarding the origin f the universe.

Sanctity of Life
The belief that life is holy and belongs to God

Abortion:
The Deliberate ending of a pregnancy by removal of the foetus

Paranormal:
Experiences which suggest that there may be a nonvisible sprit world.

Quality of life:
The value given to life depending on how far a person can take enjoyment form it.

Euthanasia:
The deliberate administering of life ending medication by a third party

Hospice:
A place which provides care for people who have serious or terminal illness

Stewardship
Looking after something that is not your own

Year 10 RE – Cycle 2 – Paper 2 – Muslim Beliefs – Edexcel

The six beliefs of Islam	The five roots of "usul ad-din in Shi'a Islam	The nature of Allah	Risalah – Messengers/Prophets
The Six Beliefs of Islam are the basic beliefs that Sunni Muslim holds to be true. They are: Tawhid – the oneness of Allah ° the existence of Malaikah, or angels ° the authority of holy books ° prophethood ° the Day of Judgement ° predestination. (Fate). • Sunni Muslims express their acceptance of these beliefs in different ways. The beliefs are considered to be important and affect the way Sunni Muslims live and behave	Shi'a Muslims accept the Five Roots of 'Usul ad-Din. These are: ° Tawhid, the oneness of Allah ° Adl, that Allah is just and fair in all things ° Nubuwwah or prophethood ° Imamah, that imams are a source of authority ° Yawm al-Qiyyamah, meaning the Day of Resurrection. • These beliefs are important for Shi'a Muslim communities as they help to unite them and give them understanding of their faith	Muslims believe Allah is unknowable and indescribable. • Muslims give Allah characteristics to be able to talk about him and try to overcome the difficulties of not being able to know him. • Muslims believe Allah is transcendent, immanent, omnipotent and beneficent. • The key beliefs about the nature of Allah are contained in the Qur'an. • Muslims use 99 names to describe the different characteristics of Allah. • Muslims may use subhahs to help them remember the 99 names of Allah	• Risalah, the belief in the communication of messages from Allah through the prophets, is very important to Muslims. • Nubuwwah, or prophets, are the messengers of Allah and the connection between Allah and humanity. • Some prophets have simply brought messages, while others have been trusted to bring sources of authority in the form of holy books. • Muslims recognise many prophets who are also seen in the other Abrahamic religions, such as Judaism and Christianity
Muslim holy books	**Malaikah - Angels**	**Al-Qadr - fate**	**Akhirah – Life after death**
Holy books, or kutub, are important to Muslims. • Muslims recognise the Tawrah, Zabur, Injil, Sahifah and the Qur'an as holy books. • The Qur'an is considered to be the most important as it is the final, complete revelation from Allah. • Holy books are a way Allah communicates with humanity and they are sources of authority and guidance for Muslims. • Muslims believe their holy books are as important today as when they were first revealed	Malaikah is an important belief in Islam – it is one of the Six Beliefs. • Muslims believe angels were created by Allah and are used as his servants. • Three angels, Jibril, Izra'il and Mika'il, are given special importance in Islam. • Muslims believe that angels are important today and will have an impact on how they live.	Al-Qadr is the Islamic belief in predestination – that Allah controls everything. • Every aspect of being a Muslim follows the idea of submission to Allah. • Muslims believe that al-Qadr and human free will do not contradict each other but work together. • Belief in al-Qadr will affect the daily life of a Muslim in how they act and behave	Akhirah is the Islamic word for life after death. • Muslims believe this life is a test for the afterlife. • The Qur'an is where Muslims get their information about the afterlife. • If they have lived their life as Allah wants, they will go to al-Jannah, paradise. • If they have not lived their life as Allah has required, they will go to Jahannam, hell. • Muslim beliefs about the afterlife will impact on the way a Muslim lives their life

Key Terms for this topic:
The six beliefs are:
1.Belief in one God (Tawhid) – This means having absolute faith in the oneness of God. Allah is simply the Arabic word for God and is not the name of any other being. Muslims believe that nothing can be likened to Allah. It is important to note that Allah has no plural in Arabic, showing the belief in the oneness of God.
2.Belief in angels (malaikah) – Muslims believe that God's greatness means he cannot communicate directly with humans. Instead, God passed messages to his **prophets** via malaikah, angels, who were God's first creation and who always obey him.
3.Belief in holy books (kutub) – The holy books of Islam should be respected. This is especially true of the **Qur'an**, which is the direct and unchanged word of God, revealed to the **Prophet Muhammad**.
4.Belief in the prophets (nubuwwah) – Allah is believed to have communicated with the prophets through the angels. Muslims believe the prophets should be respected but never worshipped.
5.Belief in the Day of Judgement and the afterlife (Akhirah) – All Muslims believe that this life is a test. When they die, they will be judged by God and sent to either Paradise or Hell.
6.Belief in predestination (Al-Qadr) – This means that everything in the universe is following a divine masterplan, which shows the importance of God's will. Muslims believe that Allah knows or decides everything that will happen: In all things the master-planning is God's (Qur'an 13:42).
These beliefs are also shared by **Shi'a** Muslims.

Nature of Allah
Characteristic Definitions
Transcendent He is above and beyond anything that exists in the world. This can make Allah difficult for Muslims to understand fully or describe.
Immanent He is close to every human and acts within the world daily. Muslims believe that everything within the universe can point to Allah.
Omnipotent He is all-powerful. This shows that Allah is in control of everything that happens and there is nothing more powerful than him.
Beneficent He is all-loving and cares for his creations on a personal level.
Merciful He forgives the things that people do wrong. He is compassionate when people are sorry. Just He judges people in a fair and unbiased way.

Stretch and challenge: How do these beliefs relate to Muslim practice in 21st Century Britain?
Homework – You will be expected to be able to answer these questions and in addition work through your homework timetable, making revision mind maps and answering exam style questions.

Physical Education KS4 Curriculum Plan 2025-26

	Year 10	Year 11	
	Leadership skills and implementing and developing tactics	Healthy participation, officiating, game play	Enrichment
Cycle 1	• **Evaluate performance** • **Embedding and continuing to develop techniques into a competitive game** • **Use and develop tactics in various situations** • **Analyse and evaluate skills as a leader and official – officiating games with support** Assessment: Booklet used - focusing on motor competence, rules, strategies, tactics, leadership, and exercising safely.	• **Evaluate performance and demonstrate improvement** • **Embedding and continuing to develop techniques into a competitive game** • **Use and develop tactics in various situations** • **Analyse and evaluate skills as a leader and official – officiating games with support** Assessment: Booklet used - focusing on motor competence, rules, strategies, tactics, leadership, exercising safely.	Football Netball Rugby Trampolining Fitness club Dance Basketball
Cycle 2	• **Evaluate performance** • **Embedding and continue to develop techniques into a competitive game** • **Use and develop tactics in various situations** • **Analyse and evaluate skills as a leader and official – officiating games with support** Assessment: Booklet used - focusing on motor competence, rules, strategies, tactics, leadership, and exercising safely.	• **Evaluate performance and demonstrate improvement** • **Embedding and continuing to develop techniques into a competitive game** • **Use and develop tactics in various situations** • **Analyse and evaluate skills as a leader and official – officiating games with support** Assessment: Booklet used - focusing on motor competence, rules, strategies, tactics, leadership, and exercising safely.	Football Netball Rugby Trampolining Fitness club Dance Basketball
Cycle 3	• **Evaluate performance** • **Embedding and continue to develop techniques into a competitive game** • **Use and develop tactics in various situations** • **Analyse and evaluate skills as a leader and official – officiating games with support** Assessment: Booklet used - focusing on motor competence, rules, strategies, tactics, leadership, and exercising safely.	• **Evaluate performance and demonstrate improvement** • **Embedding and continue to develop techniques into a competitive game** • **Use and develop tactics in various situations** • **Analyse and evaluate skills as a leader and official – officiating games with support** Assessment: Booklet used - focusing on motor competence, rules, strategies, tactics, leadership, and exercising safely.	Cricket Rounders Athletics Tennis Softball

Year 10 PE – Tactical Development/Leadership

Table Tennis

- Grip and stance
- Push – Backhand/Forehand
- Backhand Drive – application of spin
- Forehand Drive – application of spin
- Serve
- Lob and smash
- Singles and doubles play

Girls Football

Leaders:

Confidence Skills
Working with others
Leadership skills
Communication skills
Problem Solving skills.

Attacking:

- Finishing
- Passing
- Receiving
- Turning
- Moving with the ball

Defending:

- Intercepting
- Pressing
- Marking
- Challenging
- Covering and

Trampolining

- Basic moves and twists
- Seat landing plus combinations
- Swivel hips
- Front landing plus combinations
- Back landing plus combinations
- Somersaults

Netball

- Recap – recall Passing/Receiving, Ball handling, Footwork, Marking/covering, Intercepting, Dodging
- Tactical development – centre passing, backline, side line
- Game play
- Officiating
- Coaching and development

Football

- Defensive tactics
- Attack tactics
- Formations
- Set plays
- Adapting tactics
- Leadership/ coaching

Rugby

- Defensive tactics
- Attack tactics
- Formations
- Set plays
- Adapting tactics
- Leadership / coaching

HRE

- Circuit movements
- Safe and effective use of resistance machines
- Planning, conducting and evaluating a fitness programme

Stick Option 1 subject Curriculum plan here

Stick Option 1 subject Curriculum Organiser here

Stick Option 1 subject Curriculum Organiser here

Stick Option 2 subject Curriculum plan here

Stick Option 2 subject Curriculum Organiser here

Stick Option 2 subject Curriculum Organiser here

Stick Option 3 subject Curriculum plan here

Stick Option 3 subject Curriculum Organiser here

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