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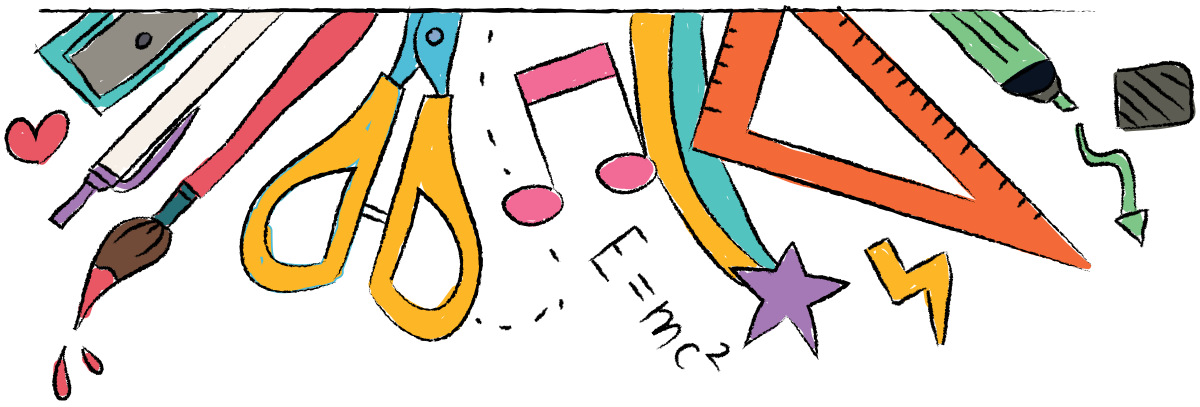
YEAR 9 - PPE CHECKLIST

A helpful resource for Pupils and Parents



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YEAR 9 - PPE CHECKLIST

Art

Students will be given an image to draw from using pencil tonal blending. Tonal pencil blending is a technique that involves layering and smudging pencils to create smooth gradients and tonal effects.

Here is a video for support:

https://youtu.be/FmsSbpsB5Vs?si=p75BcQd89tR43AMe

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YEAR 9 - PPE CHECKLIST

Biology

Topic	Topic B1: Cell level systems	R	A	G
B1.1	Describe how light microscopes and staining can be used to view cells			
	Name the main sub-cellular structures of eukaryotic cells and prokaryotic cells and explain how they are related to their functions			
	Explain how electron microscopy has increased our understanding of sub-cellular structures			
B1.2	Describe DNA as a polymer that is made up of two strands, forming a double helix			
	Describe that DNA is made from four different nucleotides			
	BIO & HT ONLY: Recall a simple description of protein synthesis			
	BIO & HT ONLY: Explain simply how the structure of DNA affects the proteins made in protein synthesis, to include the triplet code			
	Describe experiments that can be used to investigate enzymatic reactions			
	Explain the mechanism of enzyme action			

Topic	Topic B2: Scaling up	R	A	G
B2.1	Explain how substances are transported into and out of cells through diffusion, osmosis and active transport			
	Describe the process of mitosis in growth, including the cell cycle			
	Explain the importance of cell differentiation			
	Recall that stem cells are present in embryonic and adult animals and meristems in plants			
	Describe the functions of stem cells			
	Describe the difference between embryonic and adult stem cells in animals			

Topic	Topic B4: Community level systems	R	A	G
B4.1	Recall that many different substances cycle through the abiotic and biotic components of an ecosystem, with examples			
	Explain the role of microorganisms in the cycling of substances through an ecosystem Explain the importance of the carbon cycle and the water cycle to living organisms			
	BIO ONLY: Explain the effect of factors such as temperature, water content, and oxygen availability on rate of decomposition			
	Describe different levels of organisation in an ecosystem from individual organisms to the whole ecosystem			
	Explain how abiotic and biotic factors can affect communities			
	Describe the importance of interdependence and competition in a community			
	BIO ONLY: Describe the differences between the trophic levels of organisms within an ecosystem			
	BIO ONLY: Describe pyramids of biomass and explain, with examples, how biomass is lost between the different trophic levels			
	BIO ONLY: Calculate the efficiency of biomass transfers between trophic levels and explain how this affects the number of trophic levels in a food chain			

Topic	Topic B6: Global challenges	R	A	G
B6.1	Explain how to carry out a field investigation into the distribution and abundance of organisms in a habitat and how to determine their numbers in a given area			
	Describe positive and negative human interactions within ecosystems			
	Explain the impact of human interactions within ecosystems on biodiversity			
	Explain some of the benefits and challenges of maintaining local and global biodiversity			
	BIO & HT ONLY: Evaluate the evidence for the impact of environmental changes on the distribution of organisms, with reference to water and atmospheric gases			

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YEAR 9 - PPE CHECKLIST

Business

3.1.1 The purpose and nature of businesses			
Understand what a business is			
Understand the reasons for starting a business			
Understand the difference between goods and services, needs and wants			
Understand the meaning of factors of production – land, labour, capital, enterprise			
Define opportunity cost			
Define the three sectors of primary, secondary and tertiary and give examples of types of business that operate in each sector			
Understand the term enterprise and what is meant by an entrepreneur			
Outline the characteristics of an entrepreneur			
Outline the objectives of an entrepreneur			
3.1.2 Understanding different business forms			
Can explain sole traders			
Can explain partnerships			
Can explain private limited companies			
Can explain public limited companies			
Can explain non profit organisations			
Analyse the benefits and drawbacks of each legal structure			
Understand both limited and unlimited liability			
Evaluate which legal structure would be most appropriate for a variety of business examples			
3.1.3 Setting business aims and objectives			
Understand the main aims and objectives for businesses			
Understand the role of objectives in running a business			
Understand how and why the objectives set will differ between businesses			
Understand how and why the objectives set may change as businesses evolve			
Understand the success of a business can be measured in other ways than profit			
3.1.4 Stakeholders			
Understand what is meant by a stakeholder			
Understand who the main stakeholders of a business are			
Understand stakeholders' main objectives			
Understand the impact and influence stakeholders have on businesses and their objectives			
Understand how businesses may face conflict between stakeholders			
3.1.5 Business location			
Understand the factors that influence where a business is located			
3.1.6 Business planning			
Understand the reasons why businesses create business plans			
Understand the main sections of a business plan			
Analyse the benefits and drawbacks of business planning			
Understand basic financial terms and calculations			
3.1.7 Expanding a business			
Discuss the advantages and disadvantages of methods of growth			
Understand the methods used by businesses when expanding (Organic growth and External growth)			

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Chemistry

Topic	Topic C1: Particles	R	A	G
C1.1	Describe the main features of the particle model in terms of states of matter and change of state			
	Explain, in terms of the particle model, the distinction between physical changes and chemical changes			
	HT ONLY: Discuss the limitations of the particle model in relation to changes of state when particles are represented by inelastic spheres			
C1.2	Describe how and why the atomic model has changed over time			
	Describe the structure of and name the sub atomic particles			
	State the approximate size of atoms and the relative size of the nucleus and recall where most of the atom's mass is located			
	State the relative charge of protons, neutrons and electrons and describe the overall charge of an atom			
	State the relative masses of protons, neutrons and electrons and describe the distribution of mass in an atom			
	Calculate the number of protons, neutrons and electrons in an atom when given its atomic number and mass number			
	Define atomic number and mass number			
	Define an ion and an isotope and use the standard notation to represent these			

Topic	Topic C2: Elements, compounds and mixtures	R	A	G
C2.1	Explain what is meant by the purity of a substance, distinguishing between the scientific and everyday use of the term 'pure'			
	Recall how to use melting point data to distinguish pure from impure substances			
	Describe what the relative formula mass (Mr) of a compound is and calculate the relative formula mass of a compound, given its formula			
	Deduce the empirical formula of a compound			
	Explain that many useful materials are formulations of mixtures			
	Describe, explain and exemplify the processes of filtration, crystallisation, simple distillation, and fractional distillation			
	Describe the techniques of paper and thin layer chromatography			
	Recall that chromatography involves a stationary and a mobile phase			
	Recall how to interpret chromatograms, including measuring Rf values			
	Suggest suitable separation and purification techniques for different mixtures			
	Suggest chromatographic methods for distinguishing pure from impure substances			
C2.2	Describe metals and non-metals and explain the differences between them on the basis of their characteristic physical and chemical properties			
	Explain how the atomic structure of metals and non-metals relates to their position in the periodic table			
	Explain how the position of an element in the periodic table is related to the arrangement of electrons in its atoms			
	Describe how elements are placed in groups and periods and how the electrons link to group number			
	Describe and compare the nature and arrangement of chemical bonds in: ionic compounds, simple molecules, giant covalent structures, polymers and metals			
	Explain chemical bonding in terms of electrostatic forces and the transfer or sharing of electrons			
	Represent ionic compounds and simple covalent molecules using dot and cross diagrams			
	Discuss the limitations of particular representations and models, including dot and cross diagrams, ball and stick models and two- and three-dimensional representations			
	Explain how the reactions of elements are related to the arrangement of electrons in their atoms and hence to their atomic number			
	Explain in terms of atomic number how Mendeleev's arrangement was refined into the modern periodic table			

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YEAR 9 - PPE CHECKLIST

Chemistry (continued)

C2.3	Recall that carbon can form four covalent bonds			
	Explain that the vast array of natural and synthetic organic compounds occurs due to the ability of carbon to form families of similar compounds, chains and rings			
	Explain the properties of graphite, diamond, fullerenes and graphene in terms of their structure and bonding			
	Explain the different temperatures at which changes of state occur, using ideas about energy transfers and the relative strength of chemical bonds and intermolecular forces			
	Use data to predict states of substances under given conditions			
	Explain how the bulk properties of materials are related to the different types of bonds they contain, their bond strengths and the ways in which their bonds are arranged			
	CHEM ONLY: Compare the dimensions of nanoparticles to other particles and explain the effect of their high surface area to volume ratio on their properties			
	CHEM ONLY: Describe the surface area to volume relationship for different-sized particles and describe how this affects properties			
	CHEM ONLY: Describe how the properties of Nano particulate materials are related to their uses			
	CHEM ONLY: Explain the possible risks associated with some Nano particulate materials			

Topic C4: Predicting and identifying reactions and products				
Topic	**Student Checklist**	**R**	**A**	**G**
C4.1	Recall the physical and chemical properties of Groups 1, 7 and 0			
	Explain how observed simple properties of Groups 1, 7 and 0 depend on the outer shell of electrons of the atoms and predict properties from given trends down the groups			
	Recall the general properties of transition metals and their compounds and exemplify these by reference to a small number of transition metals			
	Recall how to predict possible reactions and probable reactivity of elements from their positions in the periodic table			
	Explain how the reactivity of metals with water or dilute acids is related to the tendency of the metal to form its positive ion			
	Deduce the order of reactivity of metals based on experimental data			

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YEAR 9 - PPE CHECKLIST

Computer Science

Topic	Sub topic			
1.2.3 Units	☐ The units of data storage:			
	○ Bit			
	○ Nibble (4 bits)			
	○ Byte (8 bits)			
	○ Kilobyte (1000 bytes or 1 KB)			
	○ Megabyte (1,000 KB)			
	○ Gigabyte (1,000 MB)			
	○ Terabyte (1,000 GB)			
	○ Petabyte (1,000 TB)			
	☐ How data needs to be converted into a binary format to be processed by a computer.			
	☐ Data capacity and calculation of data capacity requirements			
1.2.4 Data storage	**Numbers**			
	☐ How to convert positive denary whole numbers to binary numbers (up to and including 8 bits) and vice versa			
	☐ How to add two binary integers together (up to and including 8 bits) and explain overflow errors which may occur			
	☐ How to convert positive denary whole numbers into 2-digit hexadecimal numbers and vice versa			
	☐ How to convert from binary to hexadecimal equivalents and vice versa			
	☐ Binary shifts			
	Characters			
	☐ The use of binary codes to represent characters			
	☐ The term 'character-set'			
	☐ The relationship between the number of bits per character in a character set, and the number of characters which can be represented, e.g.:			
	○ ASCII			
	○ Unicode			
	Images			
	☐ How an image is represented as a series of pixels, represented in binary			
	☐ Metadata			

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YEAR 9 - PPE CHECKLIST

Computer Science (continued)

	☐ The effect of colour depth and resolution on:			
	○ The quality of the image			
	○ The size of an image file			
	Sound			
	☐ How sound can be sampled and stored in digital form			
	☐ The effect of sample rate, duration and bit depth on:			
	○ The playback quality			
	○ The size of a sound file			
1.2.5 Compression	☐ The need for compression			
	☐ Types of compression:			
	○ Lossy			
	○ Lossless			
1.3.1 Networks and topologies	☐ Types of networks:			
	○ LAN (Local Area Network)			
	○ WAN (Wide Area Network)			
	☐ Factors that affect the performance of networks			
	☐ The different roles of computers in a client-server and a peer-to-peer network			
	☐ The hardware needed to connect stand-alone computers into a Local Area Network:			
	○ Wireless access points			
	○ Routers			
	○ Switches			
	○ NIC (Network Interface Controller/Card)			
	○ Transmission media			
	☐ The Internet as a worldwide collection of computer networks:			
	○ DNS (Domain Name Server)			
	○ Hosting			
	○ The Cloud			
	○ Webservers and Clients			
	☐ Star and Mesh network topologies			
1.3.2 Wired and wireless networks, protocols and layers	☐ Modes of connection:			
	○ Wired			
	• Ethernet			
	○ Wireless			

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YEAR 9 - PPE CHECKLIST

Computer Science (continued)

	• Wi-Fi			
	• Bluetooth			
	☐ Encryption			
	☐ IP addressing and MAC addressing			
	☐ Standards			
	☐ Common protocols including:			
	○ TCP/IP (Transmission Control Protocol/Internet Protocol)			
	○ HTTP (Hyper Text Transfer Protocol)			
	○ HTTPS (Hyper Text Transfer Protocol Secure)			
	○ FTP (File Transfer Protocol)			
	○ POP (Post Office Protocol)			
	○ IMAP (Internet Message Access Protocol)			
	○ SMTP (Simple Mail Transfer Protocol)			
	☐ The concept of layers			
1.4.1 Threats to computer systems and networks	☐ Forms of attack			
	○ Malware			
	○ Social engineering, e.g. phishing, people as the 'weak point'			
	○ Brute-force attacks			
	○ Denial of service attacks			
	○ Data interception and theft			
	○ The concept of SQL injection			
1.4.2 Identifying and preventing vulnerabilities	☐ Common prevention methods:			
	○ Penetration Testing			
	○ Anti-malware software			
	○ Firewalls			
	○ User access levels			
	○ Passwords			
	○ Encryption			
	○ Physical Security			
2.1.1 Computational thinking	☐ Principles of computational thinking			
	○ Abstraction			
	○ Decomposition			
	○ Algorithmic Thinking.			
2.1.2 Designing, creating and	☐ Identify the inputs, processes, and outputs for a problem			
	☐ Structure diagrams			
	☐ Create, interpret, correct, complete, and refine algorithms using:			

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YEAR 9 - PPE CHECKLIST

Computer Science (continued)

refining algorithms	○ Pseudocode			
	○ Flowcharts			
	○ Reference language/high-level programming language			
	☐ Identify common errors			
	☐ Trace tables			
2.2.1 Programming fundamentals	☐ The use of variables, constants, operators, inputs, outputs and assignments			
	☐ The use of the three basic programming constructs used to control the flow of a program:			
	○ Sequence			
	○ Selection			
	○ Iteration (count- and condition- controlled loops)			
	☐ The common arithmetic operators			
	☐ The common Boolean operators AND, OR, NOT			
2.2.2 Data types	☐ The use of data types:			
	○ Integer			
	○ Real			
	○ Boolean			
	○ Character and string			
	○ Casting			
2.3.1 Defensive design	☐ Defensive design considerations:			
	○ Anticipating misuse			
	○ Authentication			
	☐ Input validation			
	☐ Maintainability:			
	o Use of sub programs			
	o Naming conventions			
	o Indentation			
	o Commenting			
2.4.1 Boolean logic	☐ Simple logic diagrams using the operations AND, OR and NOT			
	☐ Truth tables			
	☐ Combining Boolean operators using AND, OR and NOT			
	☐ Applying logical operators in truth tables to solve problems			

All resources on the above topic can be found on SharePoint.
https://stpstaff.sharepoint.com/sites/StPaulsComputerScienceIT

Further resources include:
Youtube:
Craig n Dave videos on OCR GCSE Computer Science
https://www.youtube.com/watch?v=KeN3H8_Jhbc&list=PLCiOXwirraUBnOLZCIxrLTSuIfgvYeWj-
BBC Bitesize:

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YEAR 9 - PPE CHECKLIST

Design & Technology

Technical Principles Three: Revision Topics Checklist			
Properties of triangles			
Understand the basic rules of angular calculations and trigonometry			
Understand symmetry to create tessellated patterns to minimise waste.			
Electronic Systems: Input, Process, Output			
Microcontrollers			
Types of motion: rotary, linear, oscillating, reciprocating			
Know and understand the effect of forces on the ease of movement (load, effort, fulcrum).			
Know and understand how different mechanical devices are used to change the magnitude and direction of motion or forces (cams, gears, pulleys and belts, levers and linkages).			
Graphical techniques to communicate ideas: Orthographic and Isometric drawing			
Contexts and Usability			
Synthetic Fabrics and Natural fibres			
Ferrous and Non-Ferrous Metals			
Thermo Polymers and Thermosetting Polymers			
New and Emerging Technologies			
Moral, Social, Cultural and Ethical Issues when designing			

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YEAR 9 - PPE CHECKLIST

Drama

The Yr9 PPE paper will be partly about the play ‘Noughts and Crosses’ and partly about Live Theatre.

They will be watching the National production of Jane Eyre in their lessons and they will be evaluating and analysing how actors and design elements have an impact on an audience. There will be 3 questions about this production in their PPE.

They will study ‘Noughts and Crosses’ next half term and there will be 2 questions in the PPE about how they would use performance skills to play one of the characters in the play.

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YEAR 9 - PPE CHECKLIST

English

The topic for the year 9 PPE for English will be the Power and Conflict poetry anthology, focused on one of the poems that pupils have studied this year, compared to one other poem of their choice.

Resources can be found:

School website > Sharepoint > Subjects > English > Documents > Missed it or Revisit it > Revisit it > KS3 > Year 9

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YEAR 9 - PPE
CHECKLIST

Engineering Manufacture

Topics Checklist			
Ferrous Metals, Non Ferrous Metals and Alloys			
Thermo Polymers and Thermosetting Polymers			
Composite Materials			
Stock forms of engineering materials			
Smart Materials			
Characteristics of engineering materials			
Examples of products from all engineering materials			
CNC Lathes and Milling Machines			
Effects of CNC on the workforce			
Injection moulding and other plastic processes			

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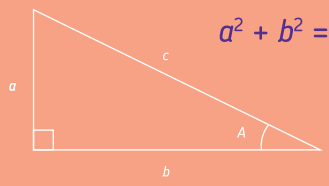
YEAR 9 - PPE CHECKLIST

Maths (Foundation)

Formulae you'll need to know

Pythagoras' theorem

In any right-angled triangle where a, b and c are the length of the sides and c is the hypotenuse:



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

Trigonometry formulae

In any right-angled triangle ABC where a, b and c are the length of the sides and c is the hypotenuse:

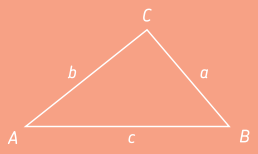
$$\sin A = \frac{a}{c} \qquad \cos A = \frac{b}{c} \qquad \tan A = \frac{a}{b}$$

In any triangle ABC where a, b and c are the length of the sides:

$$\text{sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{cosine rule: } a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = \frac{1}{2} ab \sin C$$



The quadratic formula

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

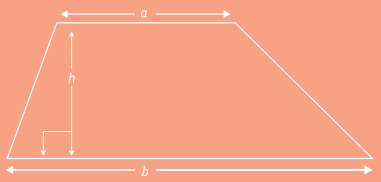
Circumference and area of a circle

Where r is the radius and d is the diameter:

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

$$\text{Area of a circle} = \pi r^2$$

Perimeter, area, surface area and volume formulae



Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

$$\text{Area of a trapezium} = \frac{1}{2}(a + b)\, h$$

Volume of a prism = area of cross section x length

Compound interest

Where P is the principal amount, r is the interest rate over a given period and n is the number of times that the interest is compounded:

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

Probability

Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B:

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ and } B) = P(A \text{ given } B)\, P(B)$$

AQA

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YEAR 9 - PPE CHECKLIST

Maths (Foundation) (continued)

www.corbettmaths.com/contents

GCSE Foundation Tier AQA Checklist 9-1

Angle Facts - Video 35, 30, 34, 39
Types of Angle - Video 38
Angles in Parallel Lines - Video 25
Angles in a Triangle - Video 37
Angles in a Quadrilateral - Video 33
Angles in Polygons - Video 32
Bearings - Videos 26, 27
Perimeter - Video 241
Area of Rectangles/Triangles - Videos 45, 49
Area of a Trapezium - Video 48
Units - Videos 347, 349
Line Symmetry - Video 316
Rotational Symmetry - Video 317
Constructions - Videos 72, 78, 83
Loci - Videos 75, 76, 77
Faces, Edges, Vertices - Videos 5, 3
Views and Elevations - Video 354
Surface Area - Video 310
Speed, Distance, Time - Video 299
Density - Video 384
Pressure - Video 385
Timetables - Video 320
Distance Charts - Video 318
Volume of a Cuboid - Video 355
Volume of a Prism - Video 356
Translations - Video 325, 326
Reflections - Videos 272, 273
Rotations - Video 275
Enlargements - Videos 104, 105, 107
Parts of the Circle - Video 61
Circumference - Video 60
Area of a Circle - Video 59
Volume of a Cylinder - Video 357
Pythagoras - Video 257
Trigonometry - Videos 329, 330, 331
Exact Trig Values - Video 341
Arc Length - Video 58
Area of a Sector - Video 46
Similar Shapes (sides) - Video 292
Congruent Shapes - Video 67
Volume of a Sphere/Cone - Videos 359, 361
Surface area of Sphere/Cone - Videos 313, 314
Vectors - Video 353a
Nets - Video 4

Multiplication - Video 199, 200
Division - Video 98
Addition - Video 6
Subtraction - Video 304
Rounding - Video 276, 277a, 277b, 278
Estimation - Video 215
Using Calculations - Video 222a
BODMAS - Video 211
Ordering Decimals/Fractions - Video 95, 144
Arithmetic with Decimals - Videos 90, 91, 92, 93, 94
Multiples and Factors - Videos 220, 216
Prime Numbers - Video 225
Square Numbers and Square Roots - Videos 226, 228
Cube Numbers and Cube Roots - Videos 212, 214
Product of Primes - Video 223
LCM/HCF - Videos 218, 219, 224
Indices - Videos 172, 174
Negative Indices - Video 175
Standard Form - Video 300, 302, 303
Fractions of Amounts - Video 137
Adding Fractions - Video 133
Multiplying Fractions - Video 142
Dividing Fractions - Video 134
Fractions, Decimals, Percentages - Videos 121 to 129
Percentages of Amounts - Videos 234, 235
Compound Interest - Video 236
Reverse Percentages - Video 240
Ratio - Videos 269, 270, 271, 271a, 271b, 271c
Currency - Video 214a
Recipes - Video 256
Negative Numbers - Videos 205-209
Place Value - Video 222
Function Machine - Video 386
Best Buys - Video 210
Error Intervals - Video 377
Proportion - Videos 255a, 254
Use of a Calculator - Video 352

Corbett maths

Frequency Trees - Video 376
Two-way Tables - Video 319
Pictograms - Videos 161, 162
Bar Charts - Videos 147, 148
Frequency Polygons - Videos 155, 156
Line Graphs - Video 160
Pie Charts - Video 163, 164
Probability - Videos 245, 246, 248
Listing Outcomes - Video 253
Scatter Graphs - Videos 165 to 168
Mode - Video 56
Median - Video 50
Mean - Video 53
Range - Video 57
Estimated Mean - Video 55
Venn Diagrams - Video 380
Tree Diagrams - Video 252
Reading Tables - Video 387
Coordinates - Video 84
Writing Expressions - Video 16
Collecting Like Terms - Video 9
Multiplying Terms - Video 18
Sequences - Videos 286, 287, 290
The nth Term - Video 288
Expanding Brackets - Videos 13, 14
Factorising - Video 117
Factorising Quadratics - Videos 118, 120
Solving Equations - Video 110, 113
Forming Equations - Videos 114, 115
Inequalities - Videos 177, 178, 179
Conversion Graphs - Video 151
Drawing Linear Graphs - Video 186
$y = mx + c$ - Video 191
Parallel graphs - Video 196
Substitution - Video 20
Changing the Subject - Video 7
Simultaneous Equations - Video 295
Quadratic Graphs - Video 264
Cubic Graphs - Video 344
Reciprocal Graphs - Video 346

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YEAR 9 - PPE CHECKLIST

Maths (Higher)

Formulae you'll need to know

Pythagoras' theorem

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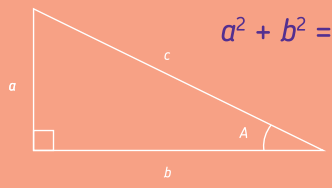


$$a^2 + b^2 = c^2$$

Trigonometry formulae

In any right-angled triangle ABC where a, b and c are the length of the sides and c is the hypotenuse:

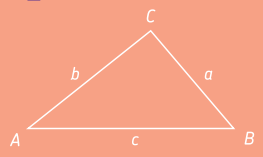
$$\sin A = \frac{a}{c} \qquad \cos A = \frac{b}{c} \qquad \tan A = \frac{a}{b}$$

In any triangle ABC where a, b and c are the length of the sides:

$$\text{sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{cosine rule: } a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = \frac{1}{2} ab \sin C$$



The quadratic formula

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

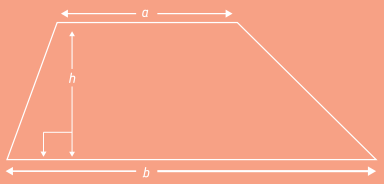
Circumference and area of a circle

Where r is the radius and d is the diameter:

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

$$\text{Area of a circle} = \pi r^2$$

Perimeter, area, surface area and volume formulae



Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

$$\text{Area of a trapezium} = \frac{1}{2}(a + b)\, h$$

Volume of a prism = area of cross section x length

Compound interest

Where P is the principal amount, r is the interest rate over a given period and n is the number of times that the interest is compounded:

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

Probability

Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B:

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ and } B) = P(A \text{ given } B)\, P(B)$$

AQA

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YEAR 9 - PPE CHECKLIST

Maths (Higher) (continued)

www.corbettmaths.com/contents

GCSE Higher Tier AQA Checklist 9-1

Corbett maths

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YEAR 9 - PPE CHECKLIST

Physics

Topic	Topic P1: Matter	R	A	G
P1.1	Describe how and why the atomic model has changed over time			
	Describe the structure of the atom and discuss the charges and relative sizes of the particles			
	State the typical size (order of magnitude) of atoms and small molecules			
	Define density			
	Explain the differences in density between the different states of matter in terms of the arrangements of the atoms and molecules			
	Apply the relationship between density, mass and volume to changes where mass is conserved			
P1.2	Describe how mass is conserved when substances melt, freeze, evaporate, condense or sublimate			
	State that physical changes differ from chemical changes because the material recovers its original properties if the change is reversed			
	Describe how heating a system will change the energy stored within the system and raise its temperature or produce changes of state			
	Define the term specific heat capacity and distinguish between it and the term specific latent heat			
	Apply the relationship between change in internal energy of a material and its mass, specific heat capacity and temperature change to calculate the energy change involved			
	Apply the relationship between specific latent heat and mass to calculate the energy change involved in a change of state			

Topic	Topic P2: Forces	R	A	G
P2.3	Explain that to stretch, bend or compress an object, more than one force has to be applied			
	Describe the difference between elastic and plastic deformation caused by stretching forces			
	Describe the relationship between force and extension for a spring and other simple systems			
	Describe the difference between linear and non-linear relationships between force and extension			
	Recall how to calculate a spring constant in linear cases			
	Recall how to calculate the work done in stretching			
	Describe that all matter has a gravitational field that causes attraction, and the field strength is much greater for massive objects			
	Define weight and describe how it is measured			
	Describe the relationship between the weight of an object and the gravitational field strength (g) (and) has a value of 10N/kg at the Earth's surface			
	Recall the acceleration in free fall			
	PHY ONLY: Apply formulae relating force, mass and relevant physical constants, including gravitational field strength (g), to explore how changes in these are inter-related			
	PHY ONLY: Describe examples in which forces cause rotation			
	PHY ONLY: Define and calculate the moment of the force in such examples			
	PHY ONLY: Explain how levers and gears transmit the rotational effects of forces			
	PHY ONLY: Recall that the pressure in fluids (gases and liquids) causes a net force at right angles to any surface			
	PHY ONLY: Recall how to use the relationship between the force, the pressure and the area in contact			

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YEAR 9 - PPE CHECKLIST

Physics (continued)

Topic	Topic P3: Electricity	R	A	G
P3.1	Describe that charge is a property of all matter, that there are positive and negative charges, and that the effects of charges are not seen since how they cancel each other out			
	Describe the production of static electricity, and sparking, by the rubbing of insulating surfaces			
	Describe evidence that charged objects exert forces of attraction or repulsion on one another when not in contact			
	Explain how transfer of electrons between objects can explain the phenomena of static electricity			
	PHY ONLY: Explain the concept of an electric field and how it helps to explain the phenomena of static electricity			
	Recall that current is a rate of flow of charge (electrons) and the conditions needed for charge to flow			
	Recall that current has the same value at any point in a single closed loop			
	Recall and use the relationship between quantity of charge, current and time			
P3.2	Describe the differences between series and parallel circuits			
	Recall how to represent d.c. circuits with the conventions of positive and negative terminals, and the symbols that represent common circuit elements			
	Recall that current depends on both resistance and potential difference and the units in which these are measured			
	Recall and apply the relationship between I, R and V, and that for some resistors the value of R remains constant but that in others it can change as the current changes			
	Explain that for some resistors the value of R remains constant but that in others it can change as the current changes			
	Explain the design and use of circuits to explore such effects			
	Recall how to use graphs to explore whether circuit elements are linear or non-linear			
	Recall how to use graphs and relate the curves produced to the function and properties of circuit elements			
	Explain why, if two resistors are in series the net resistance is increased, whereas with two in parallel the net resistance is decreased			
	Recall how to calculate the currents, potential differences and resistances in d.c. series and parallel circuits			
	Explain the design and use of such circuits for measurement and testing purposes			
	Explain how the power transfer in any circuit device is related to the potential difference across it and the current, and to the energy changes over a given time			
	Apply the equations relating potential difference, current, quantity of charge, resistance, power, energy, and time, and solve problems for circuits			

Topic	Topic P6: Global challenges	R	A	G
P6.2	Describe the main energy sources available for use on Earth, compare the ways in which they are used and distinguish between renewable and non-renewable sources			
	Explain patterns and trends in the use of energy resources			
	Recall that, in the national grid, electrical power is transferred at high voltages from power stations, and then transferred at lower voltages in each locality for domestic use			
	Describe how step-up and step-down transformers are used to change the potential difference as power is transferred from power stations			
	Explain how the national grid is an efficient way to transfer energy			
	Recall that the domestic supply in the UK is a.c. At 50Hz and about 230 volts			
	Explain the difference between direct and alternating voltage			
	Recall the differences in function between the live, neutral and earth mains wires, and the potential differences between these wires			
	Explain that a live wire may be dangerous even when a switch in the mains circuit is open, by explaining the danger of providing any connection between the live wire and earth			

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YEAR 9 - PPE
CHECKLIST

Religious Education

Pupils have started the GCSE Edexcel Religious Studies Spec A course. They will first study Judaism: Beliefs and Teachings from Paper 2. The topics they will need to revise are as follows:

Topics checklist			
The Almighty			
The Shekhinah			
The Messiah			
The Covenant with Abraham			
The Covenant at Sinai with Moses			
The Sanctity of Life and Pikuach Nefesh			
Moral Principles and the Mitzvot			
Life after Death			

Judaism Beliefs and Teachings

Key words

Talmud	The oral law passed down by Moses and then written in the Mishnah and Gemara
Decalogue	The Ten Commandments
Tenakh	Hebrew Bible consisting of Torah Nevi'im and Kathuvim.
Torah	First five books of the Old Testament
Shema	The main Jewish declaration of faith
Nevi'im	Prophets
Olam Ha-Ba	The world to come
Shavuot	Commemorates the day God gave the Torah to the nation of Israel
Teshuva	Returning to God – repentance
Mitzvot	Commandments which set rules or guides actions
Gehinnom	A place for a set time of purification of the soul- similar to purgatory.
Circumcision	Removing the foreskin of the Penis.
Pikuach Nefesh	The sanctity of life

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YEAR 9 - PPE
CHECKLIST

Religious Education (continued)

The Almighty: Key Summary Points

God is One, Creator, Lawgiver and Judge
All Jews agree on these qualities, but they may interpret them differently
God has many names in the Bible which helps Jews understand some of the characteristics of God

Importance and Significance for Jews

One

The Shema is one of the most important prayers for Jews. It begins with the words 'Hear O Israel, the Lord our God, the Lord is one. It is impossible to divide God into parts or to talk about his physical attributes. God is the only being to whom Jews should offer praise and prayer. Jews say the Shema twice a day, and keep it on a mezuzah on their doorposts.

Creator

Genesis 2:7 illustrates how God created human beings from dust. Reform Jews see this as a metaphor, but Orthodox Jews take it literally and believe everything in the universe was created by God. This is important because it means creation is a gift from God, so we must care for it. It also means life has a purpose.

Lawgiver

God gave the law to Moses on Mount Sinai so they could live good lives. These laws help Jews to keep their covenant with God. They are important because they form the basis of how Jews live their lives today. It also shows God cares about his creation.

Judge

The Tenakh teaches that God will ensure the good are rewarded and the evil are punished. God is a good judge who will treat everyone fairly. The Tenakh seems to connect this with the coming of the Messianic age. These beliefs are important because it ensures the good are rewarded and the evil are punished. It protects the world from the chaos that would happen if people didn't keep God's laws.

Key Source Evidence

Then Hashem God formed a man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being. – Genesis 2:7

Key terms and language

Shema - the main declaration of Jewish faith found in the Torah
Tenakh - The Hebrew Bible
Torah - The first five books of the Tenakh which contain the law.

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YEAR 9 - PPE
CHECKLIST

Religious Education (continued)

Shekinah: Key Summary Points

The Shekhinah means the presence of God
God is present in every aspect of life
Some Jews try to connect with the Shekhinah through Study, worship and Prayer.

Importance and Significance for Jews

The Shekhinah is not explicitly taught in the Torah, but it is felt in subtle ways by Jews engaged in:

Study

Studying the Tenakh and the Talmud is an act of worship. All Jews are encouraged to connect with God through study. At some Orthodox schools, Tenakh and Talmud study is the primary focus with other subjects taking place in the afternoon. At some strict Hassidic schools, they only focus on studying the Tenakh and Talmud.

Worship

After God told Moses to lead the Jews out of Egypt, he told them to build a portable temple (Tabernacle) where God's presence would dwell. This meant he was always with them when they pray. In modern synagogues, a light burns in front of the Ark to remind Jews of this.

Prayer

In 2 Chronicles 6, when Solomon finished his prayers in the newly-built temple, he hand the Jewish people are overcome by God's power. Jews believe they can feel that power when they pray today, whether alone or as part of a minyan.

Covenant with Abraham: Key summary points

In Judaism, a covenant is an everlasting agreement between God and man
God and Abraham entered into a covenant that promised many descendants, a Promised Land, and a blessed nation
God showed that he would keep his promises; this remains important for Jews today

Importance and significance for Jews

The idea of covenant is fundamental to all Jews. There are three parts of the covenant that Jews believe are still to be fulfilled: Promised Land (Israel), a great nation and blessing and redemption.
Jews believe that covenant with God at Sinai gave them laws to live by, and that obeying them will also fulfil the Abrahamic covenant.
Jewish men are still circumcised today as a symbol of this covenant

Key Evidence:

"I will ratify my covenant between me and you between your offspring after you, throughout their generations, as an everlasting covenant, to be a God to you and to your offspring after you" Genesis 17:7

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YEAR 9 - PPE
CHECKLIST

Religious Education (continued)

Covenant at Sinai: Key summary points

The Jewish people entered into a covenant with God after Moses has led them out of slavery in Egypt to the Promised Land
Moses received the Torah or Law, which continues to play an important role for Jews today

Importance and Significance for Jews

The Torah is the most important part of the Tenakh as it contains the Law of the covenant. These remain a guide for Jewish living today.
Jews believe they are bound to follow the teachings in the Torah because of the covenant made by Moses.
Obedience will be blessed and disobedience punished.
Study of the Torah is an important part of Jewish life

Key Evidence:

The Ten Commandments- Exodus 20:3-14
"The entire people responded together and said "everything that Hashem has spoken we will do!" Moses brought back the words of the people to Hashem." Exodus 19:8

Mitzvot: Key Summary Points

Mitzvot are commandments 613 laws in the Torah. They cover all aspects of life. Given by God to Moses Disobedience was to be punished.
They form the basis of the Halakhah – the body of Jewish law and practice.
Mitzvot form part of the covenant. Jews have free when it comes to following the Mitzvot.
They are also good deeds towards other humans- acts of living kindness.

Importance and Significance for Jews

They reflect what it means to live a Jewish life. Jews obey them as they believe this is what God requires.
They should be used to increase spirituality and improve your relationship with God.
They give religious significance to everyday things.
They make Judaism a living religion.
Many laws such as animal sacrifice are not practiced today.

Freewill

Jews agreed to live by the Mtizvot God set out but they are faced with decisions every day to choose between right and wrong those who chose to obey the commandments will be rewarded and those who choose to disobey will be punished.
Orthodox Jews believe Mitzvot was given on Sinai in the oral and written Torah. They believe you cannot understand the Almighty
Reform Jews believe Mitzvot has evolved through the generations.

Key Evidence:

'I present before you today a blessing and a curse' Deuteronomy 11:26-28

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YEAR 9 - PPE CHECKLIST

Religious Education (continued)

Life after Death: Key Summary Points

Judaism is focused on life here and now rather than the afterlife.
It does not focus about teachings about life after death.
There is a general agreement between Jews that death is not the end.

Importance and Significance for Jews

Little about life after death in the Torah. **Ecclesiastes 12:7** suggested the soul returns to God.
There is no certain teaching to say if Jews return to be part of God again or go on to an afterlife.
The Torah suggests things such as reunion with those who have died before.
Orthodox Jews believe the Messiah will come to lead a messianic age. Righteous will be resurrected and live in a restored Israel
Gan Eden A place where righteous people go after they die. Unclear if they go straight after death or in the future.
Gehinnom was thought to be a places of punishment for the unrighteous. The soul can be cleansed her before moving to Gan Eden
Olam Ha-Ba the World to come: Both the Messianic age and spiritual afterlife following physical death.

Question A

- You will need to state three points about something studied
- It will need to be three sentences not words
- 1 mark available for each sentence

Question B

- Always explain NOT describe
- You should try to use PE in your answers to ensure you make a point explain it
- Use the word because or a similar connective to help explain
- Two developed reasons in total

Question C

- Always explain NOT describe
- Give reasons and develop them fully
- You should try to use PEE in your answers to ensure you make a point explain it and support it with evidence from the bible or other sources you have looked at.

Question D

- PEER: Point, Explain, Evidence Response
- It must look at two sides of an argument
- Support arguments with evidence
- Have a reasoned conclusion

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YEAR 9 - PPE CHECKLIST

Sociology

Topics checklist			
Socialisation			
Agents of socialisation			
Social control			
Sociological Theories: Functionalism, Marxism and Feminism			
Conflict and consensus theories			
Nature V Nurture			
Identity			
Primary, Secondary, Quantitative and Qualitative Data			
Practical, Ethical and Theoretical Issues			
Reliability and validity			
Questionnaires			
Interviews			
Observations			