SCIENCE

Programme of Study: 2025-26

Science Curriculum Vision:

In Science we aim for our students to be big thinkers; to be scientifically literate; to be able to make accurate inferences from the data they are provided with every day and to make informed choices that will create a better future for themselves and our global community.

KS3:

Curriculum intent:

In Science we aim for our students to be big thinkers; to be scientifically literate; to be able to make accurate inferences from the data they are provided with every day and to make informed choices that will create a better future for themselves and our global community.

Science at KS3

We aspire for our students to discover a love of Science at the very start of their career at King's Academy Easthampstead Park that we, as their teachers, will strive to nurture and grow.

Students will study Biology, Chemistry and Physics topics that provide an excellent foundation for further study, whilst enthusing the students about the scientific process itself. In designing our curriculum, we have included all the aspects that make Science fantastic; whether it be investigating, observing, experimenting or testing out ideas and critically thinking about them. The way scientific ideas flow through the course will support our students in building a deep understanding of Science.

Students will be taught topics from all three disciplines in each block of learning and will be assessed on the breadth of their knowledge through a written test that will cover aspects of all three. The sequencing of the topics is such that key ideas develop in depth and complexity over time. For example, students first meet the particle model soon after they begin in year 7. They will then begin to classify particles as atoms, elements and compounds. They learn how elements are organised in the Periodic table in year 8 and then how particles transform through the rock cycle later that year.

Year 9 Science is an exciting time as students begin to work scientifically in more demanding contexts that expect an increasing depth of understanding. We will guide students to see the links between the traditional Biology, Chemistry and Physics disciplines so they can transfer and apply scientific ideas in a range of situations. Early in the year there is a Year 9 readiness assessment to ascertain what students have learnt in Years 7 and and 8, then this is followed by 'superlearning' where the teacher expertly guides the students in reflecting on their assessment. As the year progresses, Biology, Chemistry and Physics are taught in short spiraling blocks so the curriculum is continually interleaving content.

Our students will be confident “do-ers” of Science. They will practice using apparatus and techniques through regular practical work. We have identified key skill areas that students will master over time. We will encourage the development of skills through regular opportunities for working scientifically in lesson time. We will talk, read and write about Science and represent Science both mathematically and visually through models. Our teachers will lead by example and demonstrations will generate opportunities for students to question and be questioned. Students will be able to work resiliently and independently, but also learn from each other in group or whole-class activities. Communication skills will be assessed each time. These include; use of scientific conventions, scientific vocabulary and numerical manipulation.

The key skill areas are:

1. Scientific explanations and interpretation
2. Planning
3. Carrying out
4. Presenting scientific data
5. Evaluating evidence and arguments
6. Communication

Home Learning

Students shall be provided with topic summary sheets. Students’ engagement with and recall of the information on these sheets will be assessed as part of class time activities. Teachers will be explicit with the students which parts of the information will be assessed and when.

Kay Science is the main home learning tool in Science. It provides students with learning content which explains key information to students in the form of slides and videos and then tests students in low stakes quizzing and activities. The Kay Science curriculum has been mapped out to fit our King’s Academy Science curriculum so learning content is interleaved and therefore better cemented in the student’s mind. All students are expected to complete three Kay Science tasks per week. Where a topic area is less well understood, students will be directed to BBC Bitesize for more support. Students also have access to extra resources on Active Learn which supports our curriculum closely. Students are provided with breakdowns of their usage to take home to parents.

Year 7 and 8 Curriculum map

	Term 1	Term 2-3	Term 4-5	Term 6
Year 7	Investigating Science Science KS3 Ready	7A 7E 7G 7J 7K	7B 7D 7H 7I 7L/8J	End of Year 7 Revision 7C

Students learn how to:	Working Scientifically is introduced KS3 Ready Chemistry KS3 Ready Biology KS3 Ready Physics	7A Cells 7E Mixtures and Separation 7G The Particle Model 7J Current Electricity 7K Forces	7B Sexual Reproduction in Animals 7D Ecosystems 7H Atoms, Elements and Compounds 7I Energy 7L Sound Part A 8J Light Part A	7C Muscles and Bones
Assessment	Bunsen Burner Certificate Baseline Assessment (Google Form)	Low-Stakes Quick quiz assessment at end of each topic Baseline Assessment Retest (Google Form)	Low-Stakes Quick quiz assessment at end of each topic Assessment 2 (Google Form)	Low-Stakes Quick quiz assessment at end of each topic End of Year 7 Test Assessment 3 (Google Form)

	Term 1-2	Term 3-4	Term 5-6
Year 8	Investigating Science (Revisit) 8A 8F 8I 8C 9J 8H	8G 7F (Revisit) 9B 8K 8L	8E 9A 7L/8J 9F 8D End of Year 8 Revision
Students learn how to:	Working Scientifically 8A Food and Nutrition 8F The Periodic Table 8I Fluids	8G Metals and their Uses 7F Acids and Alkalis 9B Plant Growth 8K Energy Transfers	8E Combustion 9A Genetics and Evolution 7L Sound Part B 8J Light Part B

	8C Breathing and Respiration 9J Force Fields and Electromagnets 8H Rocks	8L Earth and Space	9F Reactivity 8D Unicellular Organisms
Assessment	Low-Stakes Quick quiz assessment at end of each topic Assessment 1 (Google Form)	Low-Stakes Quick quiz assessment at end of each topic Assessment 2 (Google Form)	Low-Stakes Quick quiz assessment at end of each topic End of Year 8 Test Assessment 3 (Google Form)

Year 9 Curriculum map

	Term 1	Term 2-3	Term 3-4	Term 5-6
Year 9	Block 1: Chemistry Biology Physics Chemistry Biology	Block 2: Biology Physics Chemistry Biology Chemistry	Block 3: Chemistry Biology Physics Chemistry	Block 4: Physics Biology Chemistry Biology Chemistry
Students learn how to:	C0 The Particle Model B1A Cells P1B Energy Transfers and Resources C1A Atomic Structure B2A Digestive System	B2A Digestive System Year 9 Readiness Test Revision P2A Electrical Circuits C1B The Periodic Table B3A Communicable Diseases C3A Mass and Concentration	C1C Group 1 and 7 B1C Transport Across Membranes P3A Density and Pressure C5 Energy Changes KS3 Biology Review KS3 Chemistry Review KS3 Physics Review	P4 Nuclear Radiation B4A Photosynthesis C2A Ionic and Metallic Bonding Paper 1 Revision B2B Circulatory System and Cancer C2B Covalent Bonding Review
Assessment	Low-stakes quizzes every 3-4 lessons Working scientifically	Low-stakes quizzes every 3-4 lessons Year 9 Readiness Assessment - Knowledge and Application Questions Superlearning Working scientifically	Low-stakes quizzes every 3-4 lessons Year 9 Core Assessments Working scientifically	Low-stakes quizzes every 3-4 lessons Working scientifically Paper 1 Practice Assessment Superlearning

Cross curricular linking: Year 7 7A History- Ancient Civilisations, PE Anatomy; 7G Geography - air pressure, pollution, Art - modelling;7I Geography and DT - energy sources, environment; 7B PSCHE/Citizenship; 7H Geography - the atmosphere, HIstory - development of ideas; 7J DT - electronics; 7C PE- fitness, exercise, breathing, Art - anatomy, PSCHE/Citizenship - drugs; 7F Geography - liming fields, pollution; 7K PE - sports. DT - presentation skills; 8E History - the Industrial Revolution; 7L Music - instruments, DT - soundproofing; Numeracy and Literacy skills to be taught explicitly throughout and highlighted in assessments	Cross curricular linking: Year 8 8A Art and English - advertising, PE - energy from food; 8I History - development of ideas, English - debating an issue; 8B Art - plants for textiles and dyes, decoration, English - plant poetry; 8G History - Bronze and Iron Age, DT - metal work; 8J Drama - stage lighting, Art - use of colour, ICT - graphics; 8H Geography - geological maps, mining; 8K DT - design of buildings and appliances, Geography - coping with different environments; 9B Geography - The Green Revolution; Geography - use of compasses Numeracy and Literacy skills to be taught explicitly throughout and highlighted in assessments

Years 10 and 11

Curriculum intent:

In Science we aim for our students to be big thinkers; to be scientifically literate; to be able to make accurate inferences from the data they are provided with every day and to make informed choices that will create a better future for themselves and our global community.

Science at KS4

Examination board: AQA
Specification title: Trilogy

Assessment objectives:
AO1: Demonstrate knowledge and understanding of: scientific ideas; scientific techniques and procedures.
AO2: Apply knowledge and understanding of: scientific ideas; scientific enquiry, techniques and procedures.
AO3: Analyse information and ideas to: interpret and evaluate; make judgments and draw conclusions; develop and improve experimental procedures.

Throughout Science at KS4 we want students to increasingly question the natural world around them.

In years 10 and 11, topics have been grouped into blocks of Biology, Chemistry and Physics. Students will rotate through the topics within each block and the breadth of their knowledge will be assessed through a written test at the end. The sequencing of the topics has been designed to allow thinking skills to develop over time, to provide increasingly abstract cognitive demand and to facilitate progression into Science subjects at KS5.

Alongside the demands of preparing for their GCSE qualifications, students and teachers will celebrate curiosity within the classroom. In our planning, we will provide opportunities for problem-solving and putting resilience into practice. Teachers will use precise questioning in class to test conceptual knowledge and skills, and assess students regularly to identify those students with gaps in learning, so that all students keep up.

It is expected that students will build upon the scientific enquiry skills they developed at KS3. They will take part in “required practicals” that will eventually form the basis of assessment at GCSE. Questions in the written exams will draw on the knowledge and understanding students have gained by carrying out the practical activities. Many questions will also focus on investigative skills and how well students can apply what they know to practical situations often in novel contexts. Communication skills will be assessed each time. These include; use of scientific conventions, scientific vocabulary and numerical manipulation.

The key skill areas are:

1. Scientific explanations and interpretation
2. Planning
3. Carrying out
4. Presenting scientific data
5. Evaluating evidence and arguments
6. Communication

We intend for our students to become ambassadors for Science. Our teachers will encourage this through fostering links with other STEM subjects (Science, Technology, Engineering and Mathematics), guiding them to paths into further study and an increasing range of extra-curricular opportunities with our partners in the community and the Enterprise program currently in place in school.

Home Learning

Students shall be provided with knowledge organisers. Students’ engagement with and recall of the information on these sheets will be assessed as part of class time activities. Teachers will be explicit with the students which parts of the information will be assessed and when.

Kay Science is the main home learning tool in Science. It provides students with learning content which explains key information to students in the form of slides and videos and then tests students in low stakes quizzing and activities. The Kay Science homework has been mapped out to fit our King’s Academy Science curriculum so learning content is interleaved and therefore better cemented in the student’s mind. All students are expected to complete six Kay Science tasks per week. Where a topic area is less well understood, students will be directed to BBC Bitesize and GCSEPod for more support. Students also have access to extra resources on Kerboodle which supports our curriculum closely. Students are also provided with end of month usage breakdown sheets that they are to bring home to parents/carers.

Years 10 and 11 Curriculum map:

	Term 1	Term 2-3	Term 4	Term 5-6

Year 10	Block 1: Year 10 Biology and Physics	Block 2: Year 10 Chemistry Biology and Physics	Block 3: Year 10 Chemistry and Revision	Block 4: Year 10 Chemistry Physics and Biology
Students learn how to:	B1 Cell biology P4 Atomic Structure	C3b Quantitative Chemistry C4 Chemical Changes B5 Homeostasis P5a Forces	C7 Organic Chemistry Revision for Paper 1 PPEs	C8 Chemical Analysis P6 Waves B7 Ecology C10 Using Resources
Assessment	Low-stakes quizzes every 3-4 lessons Biology Paper 1 Exam Physics Paper 1 Exam	Low-stakes quizzes every 3-4 lessons Chemistry Paper 1 Exam	Low-stakes quizzes every 3-4 lessons PPEs Biology Paper 1 Chemistry Paper 1 Physics Paper 1	Low-stakes quizzes every 3-4 lessons P6 B7 C8 C10 End of Block Test

	Term 1	Term 2	Term 3	Term 4-5
Year 11	Year 11 Chemistry PPE Revision	Year 11 Biology	Year 11 Physics PPE Revision	Targeted Revision Programme
Students learn how to:	C6 The rate and extent of chemical change C9 Chemistry of the atmosphere PPE Revision	Directed Improvement and Reflection Time B6 Inheritance, Variation and Evolution	P5b Motion PPE Revision and Directed Improvement and Reflection Time	Revision and Directed Improvement and Reflection Time
Assessment	Low-stakes quizzes every 3-4 lessons PPEs: Biology Paper 1 Chemistry Paper 2 Physics Paper 1	Low-stakes quizzes every 3-4 lessons	Low-stakes quizzes every 3-4 lessons PPEs Biology Paper 2 Chemistry Paper 1 Physics Paper 2	Low-stakes quizzes every 3-4 lessons Past Exam Papers marked in class

KAEP 6:

<u>Science A-level minimum requirements</u>
Level 55 or above in GCSE Science - Combined or Two Separate Sciences
Level 5 or above in GCSE Mathematics
Level 5 or above in GCSE English Language

KAEP 6: <u>CHEMISTRY</u>

Programme of Study: 2025-26

Exam board(s) and Specification(s) details: OCR A (H432)

Curriculum map:

	Term 1 and 2		Term 3 and 4		Term 5 and 6	
Year 12	Foundations in Chemistry: Atoms, Moles,	Electrons, Bonding and structure	Periodic Table and Energy	Energy	Organic Chemistry	Organic Analysis and synthesis
Students learn how to:	Atoms and reactions; reacting masses, volume	Shells, orbitals, bonding, intramolecular forces, shapes	Periodicity, Group 2 and 7 elements,	Enthalpy, Equilibrium, Kinetics	Basic Organic, isomers, alkanes, alkenes, alcohols, haloalkanes, reaction mechanism	Infra-red and mass spectroscopy; practical techniques

	and gas calculations					
Assessment	End of topic test	End of topic test	End of topic test	End of topic test	End of topic test	Full AS mock paper

KAEP 6: PHYSICS

Programme of Study: 2025-26

Exam board(s) and Specification(s) details: AQA 7408

Curriculum map:

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 12						
Students learn about:	3.1 Measurement and errors 3.1.1 Use of SI units and their prefixes 3.1.2 Limitation of physical measurement 3.1.3 Estimation of physical quantities 3.3 Waves 3.3.1 Progressive and stationary waves	3.4 Mechanics and materials 3.4.1 Force, energy and momentum 3.3 Waves 3.3.2 Refraction, diffraction and interference	3.4 Mechanics and materials 3.4.1 Force, energy and momentum 3.5 Electricity 3.5.1 Current electricity	3.5 Electricity 3.5.1 Current electricity 3.2 Particles and radiation 3.2.1 Particles	3.4 Mechanics and materials 3.4.2 Materials 3.2 Particles and radiation 3.2.1 Particles 3.2.2 E/m radiation and quantum phenomena	3.4 Mechanics and materials 3.4.2 Materials 3.2 Particles and radiation 3.2.1 Particles 3.2.2 E/m radiation and quantum phenomena Review and revision planning
Assessment	End of topic test	PPE	End of topic test	End of topic test	PPE. End of topic test	End of topic test

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 13						
Students learn about:	3.8 Nuclear physics 3.81 Radioactivity 3.6 Further mechanics 3.6.1 Periodic motion 3.6.2 Thermal physics	3.6 Further mechanics 3.6.2 Thermal physics 3.7 Fields and their consequences 3.7.1 Fields 3.7.2 Gravitational fields	3.7 Fields and their consequences 3.7.3 Electric fields	Option: Engineering (TBC)	Review and revision	
Assessment	End of topic tests	PPE End of topic tests	End of topic tests PPE (Paper 1,2,3,3a)	End of topic tests		

KAEP 6: <u>BIOLOGY</u>

Programme of Study: 2023-24

Exam board(s) and Specification(s) details: AQA AS and A-level Biology 7401, 7402

Curriculum map:

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 12						
Students learn how to:	3.1 Biological Molecules 3.1.1 Monomers and polymers 3.1.2 Carbohydrates 3.1.3 Lipids 3.1.4 Proteins RP1-Enzyme Controlled Reactions- Trypsin or amylase 3.2 Cells 3.2.1 Cell structure Microscopy practical work- graticule & biological drawing 3.2.2 All cells arise from other cells RP 2- Mitosis- preparing & observing root tip squash.	3.1 Biological Molecules 3.1.5 Nucleic acids are important information-carrying molecules 3.1.6 ATP 3.1.7 Water 3.1.8 Inorganic ions 3.2 Cells 3.2.3 Transport across cell membranes RP3- Use of calibration curve to estimate water potential	3.3 Organisms exchange substances with their environment 3.3.1 Surface area to volume ratio 3.3.2 Gas exchange Dissection of gas exchange surfaces- fish, lungs 3.2 Cells 3.2.4 Cell recognition and the immune system	3.3 Organisms exchange substances with their environment 3.3.3 Digestion and absorption 3.3.4 Mass transport RP5- Dissection of Heart Viewing Xylem & Phloem tissue	3.4 Genetic information, variation and relationships between organisms. 3.4.1 DNA, genes and chromosomes. 3.4.2 Protein synthesis. 3.4.3 Genetic diversity can arise as a result of mutation or during meiosis 3.4.4 Genetic diversity and adaptation RP 6- Aseptic technique to investigate the	3.4 Genetic information, variation and relationships between organisms. 3.4.5 Species and taxonomy. 3.4.6 Biodiversity within a community 3.4.7 Investigating diversity Revision of key year 1 concepts

		RP4- Factors affecting membrane permeability			effect of antimicrobials	
Assessment	Low stakes quizzing End of topic test Req Practical Report	Low stakes quizzing End of topic test PPE Req Practical	Low stakes quizzing End of topic test Req Practical Report	PPE Low stakes quizzing End of topic test Req Practical Report	Exams Low stakes quizzing End of topic test Req Practical Report	Low stakes quizzing End of topic test Req Practical Report

	Term 1	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Year 13						
Students learn how to:	3.5 Energy Transfers in and Between Organisms 3.5.1 Photosynthesis (A-level only) 3.5.2 Respiration (A-level only) Required practical 7: Use of chromatography to investigate the pigments isolated from leaves of different plants, eg, leaves from shade-tolerant and shade-intolerant	3.5.3 Energy and ecosystems 3.5.4 Nutrient cycles 3.7.1 Inheritance 3.6.4 Homeostasis is the maintenance of a stable internal environment Required practical 9: Investigation into the effect of a named variable on the rate of respiration of cultures of single-celled	3.7.2 Populations 3.7.3 Evolution may lead to speciation 3.7.4 Populations in ecosystems Required practical 12: Investigation into the effect of a named environmental factor on the distribution of a given species. 3.8.1 Alteration of the sequence of bases in DNA can alter the structure of proteins 3.8.3 Using genome	Revision Essay Planning Practical Catch up	Revision Essay Planning Practical Catch up	

	plants or leaves of different Colours. Required practical 8: Investigation into the effect of a named factor on the rate of dehydrogenase activity in extracts of Chloroplasts. Required practical 10: Investigation into the effect of an environmental variable on the movement of an animal using either a choice chamber or a maze.	organisms.	projects 3.8.4 Gene technologies allow the study and alteration of gene function Required practical 11: Production of a dilution series of a glucose solution			
Assessment	Low stakes quizzing End of topic test Req Practical Report	Low stakes quizzing End of topic test PPEs Req Practical	Low stakes quizzing End of topic test Req Practical Report	PPEs Low stakes quizzing End of topic test Req Practical Report	Exams Low stakes quizzing End of topic test Req Practical Report	Exams