

## The Bishop of Winchester Academy Curriculum Plan – Science

The **Science** curriculum at The Bishop of Winchester Academy has been designed with the key aim of enabling students to live life to the full. Through the acquisition of knowledge and the practised application of skill, students can have the courage to be wise and make intelligent, informed decisions.

Our knowledge-based curriculum is ambitious in its breadth and depth, offering challenge to learners irrespective of their background. Through setting high expectations and accepting no excuses for all, we counter social disadvantage and bolster aspirations. Students are nurtured and supported throughout their journey at The Bishop, and explore ways to develop their awareness, collaboration, creativity, empathy, independence and resilience, collectively referred to as our LApps (Learning Applications).

Year 7	Michaelmas (M1)	Michaelmas (M2)	Lent (L1)	Lent (L2)	Pentecost (P1)	Pentecost (P2)
Disciplinary Knowledge	<b>Enquiry Processes</b> Planning investigations Recording data Analysing & Evaluating  <b>Biology 1 (Part 1)</b> Cells Levels of organisation Joints and Muscles	<b>Biology 1 (Part 2)</b> Ecosystems Variation and Adaptation Plant Reproduction	<b>Biology 1 (Part 2)</b> Animal Reproduction  <b>Chemistry 1 (Part 1)</b> Atoms, elements, compounds The periodic table Chemical Formulae Polymers	<b>Chemistry 1 (Part 2)</b> Metal extraction Recycling The carbon cycle	<b>Chemistry 1 (Part 2)</b> Climate change  <b>Physics 1 (Part 1)</b> Forces (introduction) Motion graphs Friction and drag Turning forces Squashing and stretching	<b>Physics 1 (Part 2)</b> Food and Fuels Energy resources Conservation of Energy Energy dissipation
Disciplinary Skills	- Assessing risk - Constructing tables and graphs - Analysing and evaluating data - Using a microscope - Calculating magnification	- Collecting data of a sample  - Describing scientific phenomena	- Describing trends in the periodic table  - Formula literacy	- Using a reactivity series to determine extraction techniques - Writing displacement reaction equations - Arguing viewpoints	- Measuring forces  - Drawing graphs  - Interpreting graphs	- Conserving energy at home  - Investigating energy in foods
Personal Development	BV: Rule of Law	Sexual reproduction & health  BV: Mutual Respect  BISHOP CHARACTERS: Sir David Attenborough	LApp: Resilience	LApp: Empathy  Christian Character: Courageous Advocacy	BISHOP CHARACTERS: Sir Isaac Newton	LApp: Awareness  Planning home finances (energy bills)
Future pathways	Microbiologist  Sport Scientist	Ecologist  Conservationist  Veterinary Assistant	Chemical Engineer  Construction Engineer	Environmental Scientist  Government Adviser  Engineer	Traffic Enforcement Officer  Automotive Engineer  Painter and Decorator	Architect  Automotive Engineer

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Year 8	Michaelmas (M1)	Michaelmas (M2)	Lent (L1)	Lent (L2)	Pentecost (P1)	Pentecost (P2)
Core Objectives	<b>Biology 2 (Part 1)</b> Evolution & Natural Selection Ecosystems	<b>Biology 2 (Part 2)</b> Genetics and inheritance Digestion and diet	<b>Integrated Sciences – Energy (Part 1)</b> Bioenergetics Combustion Thermal decomposition	<b>Integrated Sciences – Energy (Part 2)</b> Reaction energy changes Energy transfer & machines Waves and energy	<b>Physics 2 (Part 1)</b> Sound Hearing Light	<b>Physics 2 (Part 2)</b> Vision Earth structure The rock cycle The night sky and space
Disciplinary Skills	- Evaluating evidence - Making predictions - Calculating percentages	- Assessing health risks - Analysing trends in data - Observing qualitative results	- Formula literacy - Writing to compare	- Planning and investigating energy changes in reactions - Evaluating models of waves	- Applying investigative approaches - Making predictions using scientific knowledge and understanding	- Writing to describe - Academic reading - Scientific developments
Character Development	LApp: Awareness BISHOP CHARACTERS: Charles Darwin	BV: Rule of Law Risk factors affecting health	LApp: Resilience	Insulating homes & financial impact	Avoiding hearing loss LApp: Empathy	Christian Character: Awe and wonder
Future pathways	Gene therapist Conservationist Ecologist	Dietician Health clinician Statistician	Chemical engineer Baker	Medical Physicist Nuclear engineer Telecommunications researcher	Stage/theatre technician Audiologist	Palaeontologist Astronomer Geologist



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Year 9	Michaelmas (M1)	Michaelmas (M2)	Lent (L1)	Lent (L2)	Pentecost (P1)	Pentecost (P2)
Core Objectives	<b>Physics 3 (Part 1)</b> Electric circuits Current Potential Difference Resistance Magnetism Electromagnets	<b>Physics 3 (Part 2)</b> Pressure Stress on solids States and pressure	<b>Chemistry 2 (Part 1)</b> Pure/impure substances Separation techniques Acids & Alkalis Neutralisation Reactions of metals with acids, oxygen and water	<b>Medical Science</b> Cells Digestive system Enzymes	<b>Medical Science</b> Circulatory system Bioenergetics Disease	<b>Pharmaceuticals</b> Development of drugs and vaccines Atomic model Electron arrangement Arranging elements Chemical measurements
Disciplinary Skills	- Calculating variables using equations  - Drawing circuits	- Analysing trends in data  - Writing to explain	- Planning preparations  - Assessing risk  - Constructing chemical equations	- Unit conversions  - Use of microscopes	- Constructing chemical equations	- Drawing electron configuration  - Calculating chemical quantities
Character Development	BV: Rule of Law  Electrical safety at home	Christian Character: Awe and Wonder	LApp: Creativity	LApp: Resilience  BV: Rule of Law	BV: Respect  LApp: Empathy	LApp: Resilience  Alexander Fleming, Edward Jenner
Future pathways	Electrician  Computer scientist	Engineer  MRI Technician	Organic Chemist  Chemical engineer	Food Scientist/Technologist  Toxicologist	Doctor  Nurse  Paramedic  Social care	Biochemist  Researcher  Pharmacist  Pharmaceutical sales

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Year 10	Michaelmas (M1)	Michaelmas (M2)	Lent (L1)	Lent (L2)	Pentecost (P1)	Pentecost (P2)
Core Objectives	<b>Engineering</b> Energy Matter Circuit diagrams Domestic Electricity Electrical calculations	<b>Innovation, Design and Technology</b> Chemical bonds Properties of substances Acids/Alkalis/pH Electrolysis Nuclear radiation	<b>Pathology and Forensic Science</b> Hormones and nerves Diabetes Reproduction and the menstrual cycle Contraception	<b>Pathology and Forensic Science</b> Inheritance  <b>Environmental Science and Evolution</b> Adaptations and competition	<b>Environmental Science and Evolution</b> Biodiversity and ecosystems Human impacts on biodiversity Carbon/water cycle Greenhouse effect	<b>Chemical Engineering</b> Rate of reaction Dynamic equilibria Organic chemistry Earth's resources Life cycle assessments
Disciplinary Skills	- Drawing more complex circuits  - Electrical calculations	- Drawing electron structure for bonding  - Predicting products	- Reading medical information on diabetes  - Writing for a specified audience on contraception	- Sampling techniques and statistical analysis	- Writing for a specified audience on climate change  - Reading and understanding different arguments on climate	- Calculating rates of reaction  - Writing life cycle assessments for products
Character Development	LApp: Creativity  Wiring a plug	BV: Respect  Christian Character: Kindness  Chernobyl, acid attacks	Types of contraception  Reproduction  Menstrual cycle  BV: Individual Liberty	Christian Character: Kindness  BISHOP CHARACTERS: Sir David Attenborough  Extinction of species	BV: Respect  LApp: Empathy  Global climate responsibility	LApp: Resilience  Depleting of the Earth's resources
Future pathways	Engineer  Electrician  Electronics engineer  IT consultant	Metal extraction  Nuclear engineer  Medical Physicist  Wastewater treatment	Pathologist  Dietician/nutritionist  Health worker  Midwife	Conservationist  Ecologist  Statistician  Countryside Ranger	Energy services  Water services  Gene therapist  Evolutionary geneticist	Chemical engineer  Product developer  Organic chemist  Petroleum engineer



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Year 11	Michaelmas (M1)	Michaelmas (M2)	Lent (L1)	Lent (L2)	Pentecost (P1)	Pentecost (P2)
Core Objectives	<b>Retrieval Practice</b> Paper 1 Biology Paper 1 Chemistry Paper 1 Physics	<b>Travel in Space</b> Forces Forces calculations Newton's Laws Waves	<b>Travel in Space</b> Electromagnetic spectrum properties, uses and risks Magnets Electromagnets Motor effect Space	<b>Retrieval Practice</b> Paper 2 Biology Paper 2 Chemistry Paper 2 Physics	<b>Retrieval Practice and External Exams</b> All 6 papers	<b>External Exams</b>
Disciplinary Skills	Use of equations - Calculations - Writing to describe, explain and compare - Analysis of data	- Force calculations - Wave calculations	- Drawing and interpreting magnetic fields and forces - Writing for a specified audience on uses/risks of the EM spectrum	- Use of equations - Calculations - Writing to describe, explain and compare - Analysis of data	- Use of equations - Calculations - Writing to describe, explain and compare - Analysis of data	
Character Development		LApp: Resilience BISHOP CHARACTERS: Sir Isaac Newton Light and vision	Creation of the Universe EM spectrum uses and risks			
Future pathways		Meteorologist Oceanographer Mechanic Automotive Engineer	Telecommunications Space engineers Astronomer Astrophysics			

