

# Syllabus match

Unit	AQA Science A 4405	OCR 21 <sup>st</sup> Century Science J241	Edexcel Science 2SC01
<b>1 Keeping healthy</b> <sup>B1</sup> 1.1 Diet, energy needs, weight, diabetes 1.2 Exercise and health 1.3 Pathogens and disease 1.4 Drugs to treat disease	B1.1 Keeping healthy	B2.1 How do our bodies resist infection?  B2.2 What are vaccines and antibiotics and how do they work?	B2. Responses to a changing environment: diabetes  B3. Problems of, and solutions to a changing environment: pathogens, disease etc.
<b>2 Control and coordination</b> <sup>B1</sup> 2.1 Nervous system and reflexes 2.2 Hormones and fertility 2.3 Homeostasis and water balance 2.4 Control in the body 2.5 Control in plants	B1.2 Nerves and hormones	B2.4 How do our bodies keep a healthy water balance?	B2. Responses to a changing environment: homeostasis, thermoregulation etc.
<b>3 Drugs and medicine</b> <sup>B1</sup> 3.1 Making new medicines 3.2 Legal and illegal drugs 3.3 Functions and disease of the heart 3.4 Effects of smoking; transplants	B1.3 The use and abuse of drugs	B2.3 What factors increase the risk of heart disease?	B3. Problems of, and solutions to a changing environment: drugs, alcohol etc.
<b>4 Adaptation and interdependence</b> <sup>B1</sup> 4.1 Competition in plants and animals 4.2 Adaptation in plants and animals 4.3 Environmental change 4.4 Extremophiles; parasitism and mutualism	B1.4 Interdependence and adaptation	B3.1 Systems in balance – how do different species depend on each other?	B3. Problems of, and solutions to a changing environment: adaptation and competition for survival, indicator species, symbiosis, parasites etc.
<b>5 Energy and biomass in food systems</b> <sup>B1</sup> 5.1 Food chains and food web 5.2 Biomass and energy transfer	B 1.5 Energy and biomass in food chains	B3.1 Systems in balance – how do different species depend on each other?	B3. Problems of, and solutions to a changing environment: food chains, trophic levels, biomass etc.
<b>6 Plant and animal waste</b> <sup>B1</sup> 6.1 Decay and decomposition; the carbon cycle 6.2 The nitrogen cycle 6.3 Population growth and its consequences	B 1.6 Waste materials from plants and animals	B3.1 Systems in balance – how do different species depend on each other?	B3. Problems of, and solutions to a changing environment: carbon cycle, nitrogen cycle, human population
<b>7 Genetics and inheritance</b> <sup>B1</sup> 7.1 Genes, reproduction, inheritance and variation 7.2 Cloning and genetic engineering 7.3 Alleles and genetic disorders	B1.7 Genetic variation and its control	B1 (All) You and your genes	B1. Classification, variation and inheritance: genes, variation, inheritance, genetic disorders etc.
<b>8 The theory of evolution</b> <sup>B1</sup> 8.1 Evolution, natural selection and selective breeding 8.2 Classifying organisms 8.3 Vertebrates; hybrids and ring	B1.8 Evolution	B3.2 How has life on Earth evolved?	B1. Classification, variation and inheritance: classification, Darwin, evolution etc.

species; classification and evolution 8.4 Continuous and discontinuous variation; biodiversity		B3.3 What is the importance of biodiversity?	
<b>9 Fundamentals of Chemistry</b> <sup>c1</sup> 9.1 Atomic structure and bonding 9.2 Chemical equations; key tests; calcium compounds	C1.1 The fundamental ideas in chemistry	C1.2 ( <i>parts of</i> ) What chemical reactions produce air pollutants? What happens to these pollutants in the atmosphere?	C2. Materials from the Earth: conservation of atoms and mass, tests for CO <sub>2</sub> /H <sub>2</sub> /O <sub>2</sub> , calcium compounds etc.
<b>10 Key chemicals in our lives</b> <sup>c1</sup> 10.1 Reactions of carbonates; chemistry of limestone 10.2 Acids and alkalis 10.3 Chlorine; electrolysis; salt; chemicals and health; life cycle assessment	C1.2 Limestone and building materials	C3.2 Where does salt come from and why is it so important?  C3.3 Why do we need chemicals such as alkalis and chlorine and how do we make them?  C3.4 What can we do to make our chemicals safe and sustainable?	C2. Materials from the Earth: limestone uses and limestone cycle etc.  C3. Acids: acids, salts, electrolysis, chlorine etc.
<b>11 Metals</b> <sup>c1</sup> 11.1 Sources, extraction and oxidation of metals 11.2 Iron, aluminium, titanium, copper 11.3 Modern metals; recycling	C1.3 Metals and their uses	N/A	C4. Obtaining and using metals (All)
<b>12 Fuels and other hydrocarbons</b> <sup>c1</sup> 12.1 Crude oil and fractional distillation 12.2 Hydrocarbons as fuels; combustion; biofuels	C1.4 Crude oil and fuels	C2.2 Why is crude oil important as a source of new materials such as plastics and fibres?  C1.2 ( <i>parts of</i> ) What chemical reactions produce air pollutants? What happens to these pollutants in the atmosphere?  C1.3 What choices can we make personally, locally, nationally or globally to improve air quality?	C5. Fuels: hydrocarbons as sources of energy, burning and its side effects, alternative fuels etc.
<b>13 Polymers and other modern materials</b> <sup>c1</sup> 13.1 Hydrocarbon cracking and polymerisation 13.2 Polymers, their properties and their uses 13.3 Other materials; nanotechnology; making ethanol	C1.5 Other useful substances from crude oil	C2.3 Why does it help to know about the molecular structure of materials such as plastics and fibres?  C2.1 How do we measure the properties of materials and why are the results	C5. Fuels: hydrocarbons used as polymers, cracking etc

		useful? C2.4 What is nanotechnology and why is it important?	
<b>14 Plant oils</b> <sup>C1</sup> 14.1 Extraction, uses, benefits and risks of vegetable oils 14.2 Emulsifiers and emulsions	C1.6 Plant oils and their uses	N/A	N/A
<b>15 The Earth's crust and atmosphere</b> <sup>P1/C1</sup> 15.1 The Earth's crust 15.2 Changing geology of the Earth's crusts 15.3 The Earth's atmosphere	C1.7 Changes in the Earth and its atmosphere	C3.1 What were the origins of minerals in Britain that contribute to our economic wealth?  C1.1 What chemicals make up the air, and which ones are pollutants?  P1.2.1-12.13 What do we know about the Earth and how it is changing?	C1. The Earth's sea and atmosphere (All)  P4. Waves and the Earth: detecting volcanic eruptions, P- and S-waves, seismometers, tectonic plates etc.
<b>16 Energy transfer by heat</b> <sup>P1</sup> 16.1 Infrared radiation and its effects 16.2 Kinetic theory: changing states, evaporation, condensation 16.3 Energy transfer: conduction, convection, evaporation, condensation 16.4 Specific heat capacity; rates of energy transfer; animal adaptations for heat 16.5 Practicalities of heat: the home, saving energy, solar heating	P1.1 The transfer of energy by heating processes and the factors that affect the rate at which that energy is transferred	P2.2 Which types of electromagnetic radiation harm living tissue and why?  P2.3 What is the evidence for global warming, why might it be occurring, and how serious a threat is it?	P2. The electromagnetic spectrum: IR radiation and its effects  P6. Energy and the future: systems at constant temperature
<b>17 Energy generation &amp; efficiency</b> <sup>P1</sup> 17.1 Energy sources and generating electricity 17.2 Transmitting electricity; electromagnetic induction 17.3 Transferring energy; energy efficiency	P1.4 Methods we use to generate electricity  P1.2 Energy and efficiency	P3.2 How can electricity be generated?  P3.3 Which energy sources should we choose?	P5. Generation and transmission of electricity: National Grid, induced currents, turns ratios, energy saving devices etc.  P.6 Energy and the future: energy transfer and types, conservation of energy, equation of efficiency
<b>18 Electricity for everyday use</b> <sup>P1</sup> 18.1 Electrical appliances 18.2 Power and energy transfer 18.3 Costing and saving energy	P1.3 The usefulness of electrical appliances	P3.1 How much energy do we use?	P5. Generation and transmission of electricity: calculating, power, payback time, energy efficiency etc.

<p><b>19 Waves and the electromagnetic spectrum</b> <sup>P1</sup></p> <p>19.1 Describing waves; sound waves; infrasound and ultrasound</p> <p>19.2 Electromagnetic waves and their uses; discovery of infrared and ultraviolet</p> <p>19.3 Hazards of electromagnetic radiation; protection against it</p> <p>19.4 The visible electromagnetic spectrum: light and its behaviour</p> <p>19.5 Waves for communication; digital and analogue; digital information</p>	<p>P1.5.1 General properties of waves</p> <p>P1.5.2 Reflection</p> <p>P1.5.3 Sound</p>	<p>P1.2.14–1.2.25: What do we know about the Earth and how it is changing?</p> <p>P2.1 What types of electromagnetic radiation are there? What happens when radiation hits an object?</p> <p>P2.4 How are electromagnetic waves used in communication?</p>	<p>P4. Waves and the Earth: sonar, infrasound, ultrasound etc.</p> <p>P2. The electromagnetic spectrum: the range of em waves, harmful effects, ionising radiation, etc.</p> <p>P1. Visible light and the Solar System: types of waves, wave equations, light, lenses, magnification, telescopes etc.</p>
<p><b>20 Earth in the Universe</b> <sup>P1</sup></p> <p>20.1 Our solar system</p> <p>20.2 Observing the Universe</p> <p>20.3 Searching for extraterrestrial life</p> <p>20.4 The Milky Way and other galaxies</p> <p>20.5 Life cycle of stars and the birth of the solar system</p> <p>20.6 Red shift; the origin and fate of the Universe</p>	<p>P1.5.4 Red shift</p>	<p>P1.1 What do we know about the place of Earth in the Universe?</p>	<p>P3. Waves and the Universe: stars and galaxies, black holes, SETI, spectrometers, red shift, Big Bang vs. Steady State theory</p>