Combined Science Paper 2 FOUNDATION

Biology

These specification points will be the **major focus** of this paper.

Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
4.5.3 Hormonal Control in Humans	-definition of 'hormone' function of the tissues and organs of the endocrine system -identifying position of glands, and the hormones secreted from them -hormones involved in control of blood glucose concentration -Type 1 and Type 2 diabetes	103-107	https://www.bbc.co.uk/bitesize/guides/zq4mk2p/revision/1 (1 to 5)	https://www.youtube.com/watch?v=c6olhi88KZs https://www.youtube.com/watch?v=77oyUdNZ054
4.6.1 Reproduction	-describe the structure of DNA -define 'genome' -structure of a chromosome -definition of 'gene' -definition of key inheritance terms e.g. heterozygous, recessive allele, phenotype -construct punnett squares -determine probability -inherited disorders -make informed judgements about the economic, social and ethical issues concerning embryo screening,	113 120-125	https://www.bbc.co.uk/bitesize/guides/zycmk2p/revision/3 https://www.bbc.co.uk/bitesize/guides/zcdfmsg/revision/1	https://www.youtube.com/watch?v=wv1TQXBQ6wQ https://www.youtube.com/watch?v=zNEtVaNQ0s8 https://www.youtube.com/watch?v=mvWy5lbUoHA https://www.youtube.com/watch?v=sYPwWHszLDo
4.7.1 Adaptations, interdependence and competition	-Describe the different levels of organisation in an ecosystem -Describe the importance of interdependence and competition in a community. -Identify biotic and abiotic factors -Suggest the factors for which organisms are competing in a given habitat	141-143	https://www.bbc.co.uk/bitesize/guides/z86gpbk/revision/1 (1 to 7)	https://www.youtube.com/watch?v=XVD5izWXmKo https://www.youtube.com/watch?v=0mjafH5pVLA
4.7.2 Organisation of an ecosystem	-interpret food chains and webs -identify producers, consumers, predators and prey from food chains and webs -describe the carbon and water cycles	145-150	https://www.bbc.co.uk/bitesize/guides/zqskv9q/revision/1	https://www.youtube.com/watch?v=dRFQ8rZCK6Q https://www.youtube.com/watch?v=urzpnjwazV0
Required Practical 7: measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species	-Using transects and quadrats are used by ecologists to determine the distribution and abundance of species in an ecosystem. -Understand the terms mean, mode and median -Calculate arithmetic means	147	https://www.bbc.co.uk/bitesize/guides/zqskv9q/revision/3	https://www.youtube.com/watch?v=2MW6nwf80XM https://www.youtube.com/watch?v=RhMOCxXcDrQ https://www.youtube.com/watch?v=yLHz2Ea10Mg&t=2s

These specification points will **not be assessed** on this paper.

Spec point	CGP Revision Guide Pages
4.5.2 The human nervous system	98-101
4.5.3.3 Hormones in human reproduction	108-109
4.5.3.4 Contraception	110-111
4.6.1.1 Sexual and asexual reproduction	114-115
4.6.1.2 Meiosis	116-117
4.6.1.6 Sex Determination	118
4.6.2.1 Variation **4.6.2.2** Evolution **4.6.2.3** Selective Breeding **4.6.3.3** Extinction **4.6.3.4** Resistant Bacteria	126-133
4.7.1.4 Adaptations	
4.7.3.1 Biodiversity	
4.7.3.3 Land Use	
4.7.3.4 Deforestation	
4.7.3.5 Global Warming	
4.7.3.6 Maintaining Biodiversity	

Chemistry

These specification points will be the **major focus** of this paper.

Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
5.6.1 Rate of Reaction **5.6.2** Reversible reactions and dynamic equilibrium	-Calculating the rate of a reaction -Describe collision theory -Define activation energy -Describe and explain the factors that increase the rate of reaction -Describe and explain the effect of catalysts on rate of reaction -identify and give examples of reversible reactions -apply the conservation of energy to reversible reactions -define dynamic equilibrium	233-245	https://www.bbc.co.uk/bitesize/guides/zpkp7p3/revision/1 https://www.bbc.co.uk/bitesize/guides/z32bpbk/revision/1 Only page 1	https://www.youtube.com/watch?v=UkrBJ6-uGFA https://www.youtube.com/watch?v=GCR5xeduq2o https://www.youtube.com/watch?v=-4HXaUBbv04 https://www.youtube.com/watch?v=hel8fQjxcO8 https://www.youtube.com/watch?v=66qcNNJFy6E
Required Practical 11: investigate how concentration affects the rates of reaction by a method involving measuring the volume of a gas produced/change in colour	-identify independent, dependent and control variables -describe how to measure the dependent variable -analyse results and draw conclusions from graphed data -calculate rate of reaction from data	237-241	https://www.bbc.co.uk/bitesize/guides/zpkp7p3/revision/6	https://www.youtube.com/watch?v=N5p06i9ilmo https://www.youtube.com/watch?v=Gl6LVl7oAlU
5.7.1 Carbon compounds as fuels and feedstock	-describe crude oil as a mixture of different length hydrocarbons -define the term hydrocarbon -identify the first 4 alkanes from their chemical formula and name them -Describe the trend in properties as hydrocarbon chain length increases -Describe and explain the process of fractional distillation -describe the process of cracking -describe the use of alkenes	246-253	https://www.bbc.co.uk/bitesize/guides/zxd4y4j/revision/1	https://www.youtube.com/watch?v=CX2IYWggEBc https://www.youtube.com/watch?v=3I7yCkSXPos https://www.youtube.com/watch?v=7AWwjKbRa_o
5.8.1 Purity, formulations and chromatography	-Define the term pure substance in chemistry -Use melting and boiling point data to identify pure and impure substances -Define the term formulation and give examples	254-256	https://www.bbc.co.uk/bitesize/guides/zp2wrwx/revision/1	https://www.youtube.com/watch?v=3oJxWwcnfJY
Required Practical 12: investigate how paper chromatography can be used to separate and tell the difference between coloured substances.	-Describe the properties of the mixtures that chromatography can be used to separate -Describe and explain the experimental process of chromatography -Explain how substances are separated using chromatography -Interpret chromatograms + -Calculate Rf values	256-258	https://www.bbc.co.uk/bitesize/guides/zp2wrwx/revision/3	https://www.youtube.com/watch?v=TdJ57SQ6GAQ https://www.youtube.com/watch?v=pnTGNAfu6GE

Spec point	Concepts	CGP revision guide pages	Bitesize	YouTube
5.9.1 The composition and evolution of the Earth's Atmosphere	-describe the composition of the current atmosphere -describe the composition of the early atmosphere and explain theories of how the early atmosphere formed -explain how the early atmosphere changed to that of the present atmosphere	262	https://www.bbc.co.uk/bitesize/guides/z9pk3k7/revision/1	https://www.youtube.com/watch?v=t1Z3GlNldLA https://www.youtube.com/watch?v=l0h_-3M0Pso
5.9.3 Common atmospheric pollutants and their sources	-State the atmospheric pollutants released into the atmosphere from the complete and incomplete combustion of fossil fuels -Describe the negative impacts of these pollutants on health and the environment	267	https://www.bbc.co.uk/bitesize/guides/zq3797h/revision/1	https://www.youtube.com/watch?v=yLp6LOgPHmI
5.10.1 Using the Earth's resources and obtaining potable water	-Describe the renewable and non-renewable resources that we get form the Earth and its atmosphere -Define the term potable water -Describe how potable water can be produced. -Describe the differences in the treatment of waste water, salt water and ground water	270-272 276	https://www.bbc.co.uk/bitesize/guides/zswfxfr/revision/1 https://www.bbc.co.uk/bitesize/guides/zg6cfcw/revision/1	https://www.youtube.com/watch?v=-XczTGavTZU https://www.youtube.com/watch?v=n7pYRQs20bI

==Exam date: 20th June==

These specification points will **not be assessed** on this paper.

Spec point	CGP Revision Guide Pages
5.9.2 Carbon dioxide and methane as greenhouse gases	156-157

These areas **may still be assessed** in multiple choice questions/linked to a previous answer, so cannot be completely ignored in your revision.

Content	CGP Revision Guide Pages
Tests for Gases	259
LCA	273

Physics

Foundation paper 2		
MAJOR FOCUS		Revision Pages
6.5.1 Forces and their interactions	- Scalar quantities – magnitude only (mass, time, temperature, speed, distance) - Vector quantities – magnitude and direction (weight, force, velocity, acceleration, displacement) - Contact forces – objects physically touching – friction, drag, tension, normal contact force - Non-contact forces – not touching – magnetism, gravity, electrostatic force - Mass is constant, weight is the force acting on a mass due to gravity, with weight and mass being directly proportional - Weight = mass x gravitational field strength (W = m x g) - Multiple forces acting on an object can be replaced by a single, resultant force	347-349
6.5.4.1 Describing motion along a line	- Explain difference between distance (scalar) and displacement (vector) - Explain difference between speed (scalar) and displacement (vector) - Typical values (all can vary) - Walking ≈ 1.5 m/s - Running ≈ 3 m/s - Cycling ≈ 6 m/s - Sound in air ≈ 330 m/s - For object moving at constant speed, distance can found using distance = speed x time (s = v x t) - A journey in a straight line can be represent by a distance-time graph - Speed can be found from the gradient of the distance-time graph - Acceleration = change in velocity/time ($a = \frac{v-u}{t}$) - Acceleration can be calculated from gradient of velocity-time graph (Final velocity)^2 – (initial velocity)^2 = 2 x acceleration x distance ($v^2 - u^2$ = 2 x a x s) - Falling objects accelerate due to force of gravity. Eventually weight = drag, resultant force = zero and object reaches terminal velocity	356-360
6.5.4.2 Forces, accelerations and Newton's laws of motion	- Newton's First Law: If the resultant force acting on an object is zero and: - Object is stationary, it remains stationary - Object is moving, it continues moving at same velocity - Velocity only changes if force acts on object - Newton's Second Law: acceleration is proportional to resultant force - Force = mass x acceleration (F = m x a) - Newton's Third Law – when two objects interact, they exert an equal and opposite force on each other	362-363
6.5.4.3 Forces and Braking	- Stopping distance = thinking distance + braking distance - Thinking distance – people naturally having different reaction times, tiredness, drugs, alcohol, distractions, speed of car - Braking distance – adverse road conditions (rain/ice/snow) condition of brakes, condition of tyres, speed of car - When brakes pressed, friction between brakes and wheel transfers energy from kinetic store to thermal store (car slows, brakes get hot) - Large deceleration can lead to brakes overheating/loss of control of car	368-369
6.6.2 Electromagnetic waves	- All EM waves are transverse, travel at speed of light (3 x 10^8 m/s) in vacuum or air - Grouped by wavelength/frequency - In order, from long wavelength (low frequency) to short (high frequency) – radio, micro, infra-red, visible, UV, x-ray, gamma) - Refraction diagrams – less dense to more dense, moves towards normal – more dense to less dense, moves away from the normal - UV/X-ray/Gamma – can have hazardous effort on human tissue, depending on size of dose/type of radiation. - Radiation measured in Sieverts – 1000 milli Sievert (1000 mSV) = 1 Sievert (1 Sv) - UV can cause skin to age prematurely and lead to skin cancer. X-ray/gamma both ionising – can cause cancer/mutation of genes.	378-383

	• Uses of EM spectrum
	   o Radio – TV and radio
	   o Microwave – satellite, wi-fi, mobile phone, heating food
	   o Infra-red – electrical heaters, cooking food, IR cameras, remote controls
	   o Visible light – telescopes, fibre optics
	   o UV – energy efficient lamps, sun-tan beds
	   o X-ray & Gamma – medical imaging and treatments	

6.7.1 Permanent and induced magnetism, magnetic forces and fields	• Magnets have north and south poles • Poles are where magnets are strongest • North & north/south & south repel • North & south attract • Permanent magnet – has own magnetic field • Induced magnet – becomes a magnet when placed in magnetic field. Always causes force of attraction. Loses magnetism quickly when removed from magnetic field • Region around magnet where force acts is called magnetic field – strength of field depends on distance from magnet • Direction of field line is north to south	386-387
6.7.2 The motor effect	• When a current flows through a wire a magnetic field is produced around the wire. • Shaping the wire into a solenoid (coil) increases the strength of the magnetic field – the field inside the solenoid is strong and uniform • Adding an iron core increases the strength of the solenoid – this is an electromagnet • When a wire carrying an electromagnet is placed in a magnetic field the field and conductor exert a force on each other – this is the motor effect • Fleming's left-hand rule show the direction of the force (thumb), field (first finger) and current (middle finger) • Force = magnetic flux density x current x length (F = B x I x l) • A coil carrying a current in a magnetic field will rotate – this is the basis of electric motors	388-389
Required Practical	• Investigate how the amount of infra-red radiation absorbed or radiated by a surface depends on the nature of the surface	381-382
Low Tariff/Linked Topics		
6.5.2 Work done and energy transfer	• Work is done on an object when a force causes it to move. • Work done = force x distance (W = F x s) • 1 joule of work done = 1 Newton metre • Work done against friction causes a rise in temperature	349
6.6.1 Waves in air, fluids and solids	• Transverse – vibrate perpendicular (90°) to direction of energy transfer. Peaks/troughs. Water waves, all electromagnetic waves. • Longitudinal – vibrate parallel to direction of energy transfer. Compressions/rarefactions. Needs particles (mechanical). Sound waves/ultrasound. • Amplitude – distance from rest point of wave to peak. • Wavelength – distance from peak to peak • Frequency – number of waves passing a point per second • Period = 1/frequency (T = 1/f) • Wave speed = frequency x wavelength (v = f x λ)	371-374
NOT ON EXAM		
6.5.3 Forces and elasticity	• Give examples of forces involved in stretching and compressing • Describe difference in elastic and inelastic deformation • Extension of spring is directly proportional to force applied as long of limit of proportionality not exceeded • Force = spring constant x extension (F = k x e) • Force on spring does work, and elastic store of spring fills • Elastic potential energy = 0.5 x spring constant x extension^2 (E$_e$ = 0.5 x k x e^2)	351-353