Combined Science - Biology Paper 2 – Foundation Tier
Personal Learning Checklist (PLC)

	Can you…?	Dates		
5.	**Homeostasis and Response**			
	Homeostasis			
5.1	Define homeostasis.			
5.2	Name three levels maintained by homeostasis.			
5.3	State that automatic control systems may involve nervous responses or chemical responses.			
5.4	Define receptors, coordination centres and effectors.			
	The Human Nervous System			
5.5	Explain how the structure of the nervous system is adapted to its functions.			
5.6	State the main function of the nervous system.			
5.7	Describe how information from receptors is carried to the brain to coordinate the response.			
5.8	Describe the roles of sensory neurones, relay neurones, motor neurones, synapses and effectors in a reflex action, and state that reflex actions are automatic and rapid.			
	Hormonal Coordination in Humans			
5.9	Define hormones and their rate of effect.			
5.10	Describe the functions and main organs of the endocrine system.			
5.11	Describe the function of the pituitary gland.			
5.12	Identify the position of the pituitary gland, pancreas, thyroid, adrenal gland, ovaries and testes on a diagram of the human body.			
5.13	Explain the role of the pancreas and insulin in the control of blood glucose concentration.			
5.14	Compare Type 1 and Type 2 diabetes and explain how they can be treated.			
5.15	State that during puberty reproductive hormones cause secondary sex characteristics to develop.			
5.16	State that testosterone is the main male reproductive hormone produced by the testes and it stimulates sperm production.			
5.17	Evaluate the different hormonal and non-hormonal methods of contraception.			
5.18	State some problems with fertility treatment.			

6.	**Inheritance, Variation and Evolution**			
	Reproduction and Genetics			
6.1	Describe sexual and asexual reproduction.			
6.2	Name the sex cells in plants and animals.			
6.3	Explain meiosis to form gametes.			

6.4	Recall that gametes join at fertilisation to restore the normal number of chromosomes.			
6.5	Explain how cell divide by mitosis.			
6.6	Recall that some organisms reproduce by both methods depending on the circumstances.			
6.7	Define a gene.			
6.8	Define the term genome.			
6.9	Discuss the importance of understanding the human genome.			
6.10	Explain the difference between genotype and phenotype.			
6.11	Explain dominant and recessive alleles .			
6.12	Define homozygous and heterozygous.			
6.13	Recall that most characteristics are a result of multiple genes interacting.			
6.14	Understand family trees.			
6.15	Use a Punnett square diagram to predict the outcome of a monohybrid cross.			
6.16	Name an Inherited disorder caused by a dominant allele.			
6.17	Name an Inherited disorder caused by a recessive allele.			
6.18	Recall the number of pairs of chromosomes in an ordinary human body.			
6.19	State the pairs of chromosomes that carries the genes that determine sex.			
6.20	Explain single gene inheritance and carry out a genetic cross to show sex inheritance.			
6.21	**Variation and Evolution**			
6.22	Describe variation.			
6.23	Give causes of variation.			
6.24	Explain how explain how evolution occurs through natural selection.			
6.25	Describe selective breeding.			
6.26	Define some chosen characteristics for selective breeding.			
6.27	Explain the problems with 'inbreeding'.			
6.28	Describe genetic engineering.			
6.29	Give examples of uses of genetic engineering.			
6.30	Define GM crop and give examples.			
6.31	State some concerns about GM crops.			
6.32	Recall the possibility of genetic modification to overcome some inherited diseases.			

	The Development of Understanding of Genetics and Evolution			
6.33	State reason why the theory of evolution by natural selection was only gradually accepted.			
6.34	State evidence for evolution by natural selection.			
6.35	Define fossils and explain how they are formed.			

6.36	Explain why there are no fossils of many early forms of life.			
6.37	Recall that we can learn from fossils how much or how organisms have changed.			
6.38	List some possible causes of extinction.			
6.39	Explain the emergence of antibiotic resistant bacteria.			
6.40	Recall that MRSA is resistant to antibiotics.			
6.41	Describe how to reduce the rate of development of antibiotic resistant strains.			
	Classification of Living Organisms			
6.42	Describe the Linnaeus system to classify living things and name the levels.			
6.43	State that organisms are named by the binomial system of genus and species.			
6.44	Know that new models of classification have been proposed based on improved analysis.			
6.45	Define the 'three-domain system' developed by Carl Woese.			
6.46	Understand that evolutionary trees are a method used by scientists to show how they believe organisms are related.			

7.	**Ecology**			
	Adaptations, Interdependence and Competition			
7.1	Suggest the factors for which organisms are competing in a given habitat.			
7.2	Suggest how organisms are adapted to the conditions in which they live.			
7.3	Define an ecosystem.			
7.4	Define interdependence.			
7.5	Explain what is meant by a 'stable community'.			
7.6	Explain how a change in an abiotic factor would affect a given community.			
7.7	List abiotic factors.			
7.8	Explain how a change in a biotic factor might affect a given community.			
7.9	List biotic factors.			
7.10	Explain how organisms are adapted to live in their natural environment.			
	Organisation of an Ecosystem			
7.11	Define a producer, primary consumers, secondary consumers and tertiary consumers.			
7.12	Construct food chains.			
7.13	Explain the use of transects and quadrats.			
7.14	Explain why, in a stable community, the numbers of predators and prey rise and fall in cycles.			
7.15	Recall the carbon cycle.			
7.16	Recall the water cycle.			
7.17	Explain the role of microorganisms in cycling materials through an ecosystem.			
7.18	Recall that biogas generators can be used to produce methane gas as a fuel.			

7.19	State some environmental changes.			
	Biodiversity and the effect of Human Interaction on Ecosystems			
7.20	Define biodiversity.			
7.21	State the benefit of ensuring a great biodiversity.			
7.22	Explain how human activities are reducing biodiversity.			
7.23	Understand that rapid growth in the human population and an increase in the standard of living mean that increasingly more resources are used and more waste is produced. Unless waste and chemical materials are properly handled, more pollution will be caused.			
7.24	Explain how pollution can occur on land, in air and in water.			
7.25	State how humans reduce the amount of land available for other animals.			
7.26	Explain the destruction of peat bogs.			
7.27	State why large-scale deforestation in tropical areas has occurred.			
7.28	List the consequences of deforestation.			
7.29	Describe global warming.			
7.30	State the biological consequences of global warming.			
7.31	Explain how humans are trying to reduce these negative effects.			

Required Practicals

RP6	Plan and carry out an investigation into the effect of a factor on human reaction time.			
RP7	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.			

Mathematical Skills (Paper 1+2)

Arithmetic and Numerical	A.	Express numbers in decimal form.			
	B.	Express numbers in standard form.			
	C.	Use ratios, fractions and percentages.			
	D.	Make estimates of the results of simple calculations.			
Handling Data	E.	Use an appropriate number of significant figures.			
	F.	Calculate the mean.			
	G.	Understand the terms mean, mode and median.			
	H.	Make order of magnitude calculations.			
Algebra	I.	Understand and use the symbols: =, <, <<, >>, >, α, ~			
	J.	Change the subject of an equation.			
	K.	Substitute numerical values into equations using appropriate units.			
Graphs	L.	Understand that $y = mx+c$ represents a linear relationship.			
	M.	Plot a line graph from experimental data, including drawing a line of best fit.			
	N.	Determine the gradient and intercept of a linear graph.			
	O.	Draw a tangent to a curve and calculate its gradient as a measure of the rate of change.			
Geometry and Trigonometry	P.	Visualise and represent 2D and 3D forms.			
	Q.	Calculate areas of triangles and rectangles.			
	R.	Calculate surface areas and volumes of cubes.			