AQA GCSE **– Biology** – Paper 2 Learning Pathway

B10	The Human Nervous System		Revised	Understood
B10.1	Principals of homeostasis	Know that homeostasis is Know why it is important to maintain conditions for enzyme action Know how receptors, coordination centres, and effectors work together		
B10.2	The structure of the nervous system	Know that electrical impulses are used to react to the environment Know that receptors detect stimuli and give examples Be able to describe how messages are passed from a stimulus to a response		
B10.3	Reflex action	Know what a reflex action is and give examples Know the stages of a reflex arc		
B11	**Hormonal Coordination**			
B11.1	Principals of hormonal control	Know what the endocrine system is made up of Know the different glands and what they secrete, also which is the most important		
B11.2	Control of glucose level	Know that the pancreas monitors and controls your glucose level Know the hormones produced and how they regulate blood sugar		
B11.3	Treating diabetes	Know the difference between the two types of diabetes, and how they are managed		
B11.4	Negative feedback (H)	Know the role of Thyroxin and how it effects metabolic rate Know when adrenaline is produced and its effect Know that thyroxin is controlled by negative feedback, adrenaline is not		
B11.5	Human reproduction	Know the changes that occur during puberty Know the stages to the menstrual cycle and the hormones present and their role. Know what the male hormone is called and what roles it plays		
B11.6	Hormones in the menstrual cycle (H)	Know how the 4 female hormones interact in the menstrual cycle		
B11.7	Artificial control of fertility	Know the different hormonal and non-hormonal contraceptives and their advantages and disadvantages.		
B11.8	Infertility treatments (H)	How female hormones can be used to stimulate fertility Know the principals of IVF, and the risks associated		

B13	Reproduction			
B13.1	Types of reproduction	Know what asexual reproduction is in terms of genetic information and mitosis Know the principals of sexual reproduction in terms of meiosis		
B13.2	Cell division in sexual reproduction	Know how cells divide to form gametes and what a gamete is. Know how many sets of chromosomes body cells and gametes have. Be able to describe meiosis.		
B13.4	DNA and the genome	Know what a genome is. Know that the human genome has been studied and why it is important for medicine. Be able to describe the structure of DNA. Know what a gene is and how it relates to amino acids.		
B13.7	Inheritance in action	Understand the term, gene, alleles, genotype phenotype heterozygous, homozygous. And how they link to inherited characteristics.		

B13.8	More about genetics	Be able to interoperate and use a punnet square diagram to predict genetic inheritance. Know that human cells contain 23 pairs of chromosomes, 22 control general body characteristics, and one determines sex, males are XY, females are XX.		
B13.9	**Inherited disorders**	Know some disorders are inherited. Know polydactyly is a dominant phenotype caused by a dominant allele which can be inherited from either or both parents. Know cystic fibrosis is a recessive phenotype caused by recessive alleles which must be inherited from both parents.		
B13.10	Screening for genetic disorders	Know that embryos and foetuses can be screened for the alleles that cause genetic disorders. Know embryo and fetal cells are used to identify genetic disorders but screening raises economic, social and ethical issues.		
B14	Variation and Evolution			
B14.1	Variation	Know what variation is. Know how environment and genetics can lead to variation.		
B14.2	Evolution by natural selection	Be able to define evolution by natural selection. Know how mutations can lead to a new phenotype. Know a new species is formed if they can no longer interbreed to form fertile offspring.		
B14.3	Selective breeding	Know what selective breeding is. Know what desired characteristics might be for food production in plants and animals, domestic dogs and scented flowers. Know what problems can be caused by selective breeding.		
B14.4	Genetic engineering	Be able to define genetic engineering. Know what a GM crop is and what its benefits are. (H) Know how genetic engineering is done.		
B14.7	Ethics of genetic technologies	Know that scientists are trying to make genetic modifications to overcome some inherited diseases. Know the benefits and risks of genetic engineering.		
B15	**Genetics and Evolution**			
B15.5	Evidence for evolution	Know where fossils can be found and how they are formed. Know that they help us understand organisms that lived millions of years ago but know what it is hard to be sure how life began.		
B15.6,7	Fossils and extinction	Know what we can learn from fossils about how life has changed Know what might have caused extinctions		
B15.8	Antibiotic resistant bacterial	Know how antibiotic resistant bacteria arise. Know what it is hard to overcome the problem, and what is being done.		
B15.9	Classification	Know how Carl Linnaeus classified organisms. Know that as microscopes improved new models of classification were developed		
B15.10	New systems of classification	Know how to classify organisms into archaea, bacteria and eukaryota Know how classification helps us to understand evolution Know how evolutionary trees help us suggest relationships between organisms.		
B16	Adaptation, interdependence and competition			
B16.1	The importance of communities	Know what an ecosystem is. Know what organisms need to survive and reproduce Know how different species can be interdependent Know what a stable community is		
B16.2	Organisms and their environment	Now how abiotic and biotic factors affect communities of organisms.		

B16.3	Distribution and abundance	Know how to measure population size using transects and quadrats.		
B16.4	Competition in animals	Know how animals compete for food, territories and mates and how they adapt to do this.		
B16.5	Competition in plants	Know what plants compete for and how they are adapted to do this.		
B16.6	Adapt and survive	Know what animals need from their environment to survive and how they are adapted to get them. Know that extremophiles are adapted to live in extreme conditions, e.g. salt, temperature, pressure		
B16.7-8	Adaptations in animals and plants	Be able to describe and explain adaptations of organisms to help them survive. Structural behavioural or functional		
B17		**Organising an ecosystem**		
B17.2	Materials cycling	Know how CO_2 and water are recycled in the environment to provide materials for future organisms.		
B17.3	The carbon cycle	Be able to explain the carbon cycle including, carbon in organisms, CO_2 and photosynthesis.		
B18		**Biodiversity and ecosystems**		
B18.1	The human population explosion	Know what biodiversity is, and why a high biodiversity is good. Know the effect of humans on biodiversity and what can be done to improve it. Know that the rapid growth human population has led to more resources being used and more waste		
B18.2	Land and water pollution	Know that unless waste and chemicals are handled carefully more pollution can be produced. E.g. Pesticides and herbicides, and sewage. Know that pollution kills plants and animals which reduces biodiversity		
B18.3	Air pollution	Smoke can acidic gases can cause air pollution, this can kill organisms reducing biodiversity		
B18.4	Deforestation peat and destruction	Know why deforestation has occurred. Know how the destruction of peat bogs reduces biodiversity Know how burning peat leads to more CO_2 in the atmosphere		
B18.5	Global warming	Know some greenhouse gases. Know the effects of global warming on habitat and migration patterns.		
B18.7	Maintaining Biodiversity	Understand how people have put measures into place to help protect ecosystems and biodiversity.		

AQA GCSE **– Biology** – Paper 2 Learning Pathway

B10	The Human Nervous System		Revised	Understood
B10.1	Principals of homeostasis	Know that homeostasis is Know why it is important to maintain conditions for enzyme action Know how receptors, coordination centres, and effectors work together		
B10.2	The structure of the nervous system	Know that electrical impulses are used to react to the environment Know that receptors detect stimuli and give examples Be able to describe how messages are passed from a stimulus to a response		
B10.3	Reflex action	Know what a reflex action is and give examples Know the stages of a reflex arc		
B11	**Hormonal Coordination**			
B11.1	Principals of hormonal control	Know what the endocrine system is made up of Know the different glands and what they secrete, also which is the most important		
B11.2	Control of glucose level	Know that the pancreas monitors and controls your glucose level Know the hormones produced and how they regulate blood sugar		
B11.3	Treating diabetes	Know the difference between the two types of diabetes, and how they are managed		
B11.4	Negative feedback (H)	Know the role of Thyroxin and how it effects metabolic rate Know when adrenaline is produced and its effect Know that thyroxin is controlled by negative feedback, adrenaline is not		
B11.5	Human reproduction	Know the changes that occur during puberty Know the stages to the menstrual cycle and the hormones present and their role. Know what the male hormone is called and what roles it plays		
B11.6	Hormones in the menstrual cycle (H)	Know how the 4 female hormones interact in the menstrual cycle		
B11.7	Artificial control of fertility	Know the different hormonal and non-hormonal contraceptives and their advantages and disadvantages.		
B11.8	Infertility treatments	How female hormones can be used to stimulate fertility Know the principals of IVF, and the risks associated		

B13	Reproduction			
B13.1	Types of reproduction	Know what asexual reproduction is in terms of genetic information and mitosis Know the principals of sexual reproduction in terms of meiosis		
B13.2	Cell division in sexual reproduction	Know how cells divide to form gametes and what a gamete is. Know how many sets of chromosomes body cells and gametes have. Be able to describe meiosis.		
B13.4	DNA and the genome	Know what a genome is. Know that the human genome has been studied and why it is important for medicine. Be able to describe the structure of DNA. Know what a gene is and how it relates to amino acids.		
B13.7	Inheritance in action	Understand the term, gene, alleles, genotype phenotype heterozygous, homozygous. And how they link to inherited characteristics.		

B13.8	More about genetics	Be able to interoperate and use a punnet square diagram to predict genetic inheritance. Know that human cells contain 23 pairs of chromosomes, 22 control general body characteristics, and one determines sex, males are XY, females are XX.		
B13.9	Inherited disorders	Know some disorders are inherited. Know polydactyly is a dominant phenotype caused by a dominant allele which can be inherited from either or both parents. Know cystic fibrosis is a recessive phenotype caused by recessive alleles which must be inherited from both parents.		
B13.10	Screening for genetic disorders	Know that embryos and foetuses can be screened for the alleles that cause genetic disorders. Know embryo and fetal cells are used to identify genetic disorders but screening raises economic, social and ethical issues.		
B14	Variation and Evolution			
B14.1	Variation	Know what variation is. Know how environment and genetics can lead to variation.		
B14.2	Evolution by natural selection	Be able to define evolution by natural selection. Know how mutations can lead to a new phenotype. Know a new species is formed if they can no longer interbreed to form fertile offspring.		
B14.3	Selective breeding	Know what selective breeding is. Know what desired characteristics might be for food production in plants and animals, domestic dogs and scented flowers. Know what problems can be caused by selective breeding.		
B14.4	Genetic engineering	Be able to define genetic engineering. Know what a GM crop is and what its benefits are. (H) Know how genetic engineering is done.		
B14.7	Ethics of genetic technologies	Know that scientists are trying to make genetic modifications to overcome some inherited diseases. Know the benefits and risks of genetic engineering.		
B15	**Genetics and Evolution**			
B15.5	Evidence for evolution	Know where fossils can be found and how they are formed. Know that they help us understand organisms that lived millions of years ago but know what it is hard to be sure how life began.		
B15.6,7	Fossils and extinction	Know what we can learn from fossils about how life has changed Know what might have caused extinctions		
B15.8	Antibiotic resistant bacterial	Know how antibiotic resistant bacteria arise. Know what it is hard to overcome the problem, and what is being done.		
B15.9	Classification	Know how Carl Linnaeus classified organisms. Know that as microscopes improved new models of classification were developed		
B15.10	New systems of classification	Know how to classify organisms into archaea, bacteria and eukaryota Know how classification helps us to understand evolution Know how evolutionary trees help us suggest relationships between organisms.		
B16	Adaptation, interdependence and competition			
B16.1	The importance of communities	Know what an ecosystem is. Know what organisms need to survive and reproduce Know how different species can be interdependent Know what a stable community is		
B16.2	Organisms and their environment	Now how abiotic and biotic factors affect communities of organisms.		

B16.3	Distribution and abundance	Know how to measure population size using transects and quadrats.		
B16.4	Competition in animals	Know how animals compete for food, territories and mates and how they adapt to do this.		
B16.5	Competition in plants	Know what plants compete for and how they are adapted to do this.		
B16.6	Adapt and survive	Know what animals need from their environment to survive and how they are adapted to get them. Know that extremophiles are adapted to live in extreme conditions, e.g. salt, temperature, pressure		
B16.7-8	Adaptations in animals and plants	Be able to describe and explain adaptations of organisms to help them survive. Structural behavioural or functional		
B17		**Organising an ecosystem**		
B17.2	Materials cycling	Know how CO_2 and water are recycled in the environment to provide materials for future organisms.		
B17.3	The carbon cycle	Be able to explain the carbon cycle including, carbon in organisms, CO_2 and photosynthesis.		
B18		**Biodiversity and ecosystems**		
B18.1	The human population explosion	Know what biodiversity is, and why a high biodiversity is good. Know the effect of humans on biodiversity and what can be done to improve it. Know that the rapid growth human population has led to more resources being used and more waste		
B18.2	Land and water pollution	Know that unless waste and chemicals are handled carefully more pollution can be produced. E.g. Pesticides and herbicides, and sewage. Know that pollution kills plants and animals which reduces biodiversity		
B18.3	Air pollution	Smoke can acidic gases can cause air pollution, this can kill organisms reducing biodiversity		
B18.4	Deforestation peat and destruction	Know why deforestation has occurred. Know how the destruction of peat bogs reduces biodiversity Know how burning peat leads to more CO_2 in the atmosphere		
B18.5	Global warming	Know some greenhouse gases. Know the effects of global warming on habitat and migration patterns.		
B18.7	Maintaining Biodiversity	Understand how people have put measures into place to help protect ecosystems and biodiversity.		