JSTC ALFORD **Curriculum Map**

Biology Year 10				
	Topic / Theme	Knowledge and Skills	Assessment	Cultural Capital Independent Learning
Autumn – Term 1	B10 Human Nervous System	Cells in the body can only survive within narrow physical and chemical limits. They require a constant temperature and pH as well as a constant supply of dissolved food and water. In order to do this the body requires control systems that constantly monitor and adjust the composition of the blood and tissues. These control systems include receptors which sense changes and effectors that bring about changes. In this section we will explore the structure and function of the nervous system and how it can bring about fast responses.	JSTC Docs on Science drive: B10 exam questions on reflex arc, B10 exam question on synapses. Kerboodle B10: • progress quizes • On your marks exam skills • homework 1 and 2 • exam style questions F and H • interactive practise and test • end of unit test. • Required practical B7 On your marks: Exam skills	SMSC – ethical issues of new treatments, brain and eye disorders Careers – Neurologist, MRI/CAT scan technician, optician, dispenser, glasses manufacturing, eye specialist. Fasting during Ramadan – homeostatic mechanisms in action. Reflexes – investigate common reflexes. How do doctors check your reflexes are working? Eg) Babinski and Snout reflexes. What problems can they indicate? Diseases of the nervous system – motor neurone disease. Cause, symptoms,

				treatments. Link in to stem cell research.

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	B11 Hormonal Coordination	Cells in the body can only survive within narrow physical and chemical limits. They require a constant temperature and pH as well as a constant supply of dissolved food and water. In order to do this the body requires control systems that constantly monitor and adjust the composition of the blood and tissues. These control systems include receptors which sense changes and effectors that bring about changes. In this section we will explore the hormonal system which usually brings about much slower changes. Hormonal coordination is particularly important in reproduction since it controls the menstrual cycle. An understanding of the role of hormones in reproduction has allowed scientists to develop not only contraceptive drugs but also drugs which can increase fertility.	JSTC Docs on Science drive: B11 exam questions controlling fertility; plant hormones; fertility; sugar control Kerboodle B10: • progress quizzes • On your marks exam skills • homework 1 and 2 • exam style questions F and H • interactive practise and test • end of unit test. • Required practical B11 On your marks: Exam skills	SMSC – New drugs, ethical issues, drug testing, ethics of reproductive biology Careers – Endocrinologist, sexual health worker, reproductive biologist, Immunologist, reproductive medicine. Illnesses caused by hormonal imbalances eg) Overactive/underactive thyroid, PCOS, pituitary tumours. Link type 2 diabetes to the obesity crisis. Discuss risk of other illnesses because of obesity. How could this be helped within school? Come up with an action plan. Human reproduction – contraception, preparing the body for pregnancy, issues with fertility. Ethical debate around IVF, abortion.

				Other options – adoption, sperm donors, discuss same-sex couples/ Baby with three parents to avoid mitochondrial disease. How are plant hormones used to get the fruits/vegetables in our supermarkets?

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Spring– Term 3	B12 Homeostasis in Action	Cells in the body can only survive within narrow physical and chemical limits. They require a constant temperature and pH as well as a constant supply of dissolved food and water. In order to do this the body requires control systems that constantly monitor and adjust the composition of the blood and	JSTC? B12 checkpoint quiz B12 Progress quiz B12 Homework sheet B12 Exam Level questions for use as tests	SMSC – medical provision Careers/sectors – dialysis nurse, transplant surgeon Build up of carbon dioxide (hypercapnia) - how can this happen? Why is it a problem? Colour and volume of urine throughout the day – running a marathon. Look at

		tissues. These control systems include receptors which sense changes and effectors that bring about changes. In this section we will explore the structure and function of the nervous system and how it can bring about fast responses. We will also explore the hormonal system which usually brings about much slower changes. Hormonal coordination is particularly important in reproduction since it controls the menstrual cycle. An understanding of the role of hormones in reproduction has allowed scientists to develop not only contraceptive drugs but also drugs which can increase fertility.		hydration levels, temperature. Diabetes insipidus – causes excessive urination, how is it treated? Kidney transplant – process of finding a donor. How to become an organ donor – opportunity to discuss religious views for/against. Living without a kidney Deciding whether someone is suitable for a transplant or alternative treatments are more suitable. Consider risks, lifestyle changes, cost.

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Curriculum Map

	Topic / Theme	Knowledge and Skills	Assessment	Cultural Capital Independent Learning
Spring – Term 4	B13 Reproduction	In this section we will explore the structure and function of the nervous system and how it can bring about fast responses. We will also explore the hormonal system which usually brings about much slower changes. Hormonal coordination is particularly important in reproduction since it controls the menstrual cycle. An understanding of the role of hormones in reproduction has allowed scientists to develop not only contraceptive drugs but also drugs which can increase fertility.	B13 Checkpoint quiz B13 homework B13 progress quiz B13 On your marks B13 exam level questions for tes	SMSC – Ethics of birth control, contraception and the religious stance. Ethics of IVF provision and the use of embryos for research, embryo rights. Use of stem cell technology and the ethics of embryo rights, cost and economics of IVF, multiple birth families. Careers/sectors – reproductive biologist, IVF clinic nurse, biochemist. Reproduction in malaria parasites – spraying standing water to limit reproduction. Methods in developing countries. Discovery of the double-helix: Watson and Crick, Franklin (influential women in Science) Human genome project – could potentially go the GP and have our genome

				displayed immediately. What would the implications of this be? Inherited disorders – stages of genetic screening. Genetic counselling and potential options for treating offspring. Gene therapy – ethical debate from multiple viewpoints.

Biology Year 10				
Summer – Term	Topic / Theme	Knowledge and Skills	Assessment	Cultural Capital Independent Learning
	B14 Variation and Evolution	In this section we will discover how the number of chromosomes are halved during meiosis and then combined with new genes from the sexual partner to produce unique offspring. Gene mutations occur continuously and on rare occasions can affect the functioning of the	B14 checkpoint quiz B14 progress quiz B14 homework B14 On your marks B14 Exam style questions for test	SMSC – Ethics of GM and genetic engineering Careers/sectors – evolutionary biologist, genetic engineer, Farm workers and artificial insemination technicians, stud farming

		animal or plant. These mutations may be damaging and lead to a number of genetic disorders or death. Very rarely a new mutation can be beneficial and consequently, lead to increased fitness in the individual. Variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve. An understanding of these processes has allowed scientists to intervene through selective breeding to produce livestock with favoured characteristics. Once new varieties of plants or animals have been produced it is possible to clone individuals to produce larger numbers of identical individuals all carrying the favourable characteristic. Scientists have now discovered how to take genes from one species and introduce them in to the genome of another by a process called genetic engineering. In spite of the huge potential benefits that this technology can offer, genetic		Variation within the classroom. Variation of dogs – look at adaptations developed through selective breeding, interbreeding and well-known genetic problems. Ethics of twin studies – controlling different factors. Talk about the considerations for medical studies - length of time, sample size, control variables, environment, cost. Darwin's life story – study of the finches in the Galapagos Islands, competition with Alfred Wallace and opposing religious views. Evidence for/against evolution as still some people who don't believe – discuss religious views.

		modification still remains highly controversial.		

Biology Year 10				
	Topic / Theme	Knowledge and Skills	Assessment	Cultural Capital Independent Learning
Summer – Term 6	B15 Genetics and Evolution	In this section we will discover how the number of chromosomes are halved during meiosis and then combined with new genes from the sexual partner to produce unique offspring. Gene mutations occur continuously and on rare occasions can affect the functioning of the animal or plant. These mutations may be damaging and lead to a number	B15 Checkpoint quiz B15 homework B15 Progress quiz B15 On your marks	SMSC – Ethics of GM and genetic engineering Careers/sectors – evolutionary biologist, geneticist, palaeontologist Mendel's life story – how did he discover monohybrid inheritance? Process of publishing his findings. Opposing views.

		of genetic disorders or death. Very rarely a new mutation can be beneficial and consequently, lead to increased fitness in the individual. Variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve. An understanding of these processes has allowed scientists to intervene through selective breeding to produce livestock with favoured characteristics. Once new varieties of plants or animals have been produced it is possible to clone individuals to produce larger numbers of identical individuals all carrying the favourable characteristic. Scientists have now discovered how to take genes from one species and introduce them in to the genome of another by a process called genetic engineering. In spite of the huge		Discovery of the double helix – Watson and Crick, Franklin and Wilkins. Theories of evolution - Darwin vs Lamarck Life story of Darwin – what was his process for gathering evidence? Variety of evidence? Opposing views – link to religion at the time. Darwin's finches. Formation of the Galapagos Islands and differences between the islands, protected sites. Alfred Wallace – life story and competition with Darwin. Mount Bosavi in Papua New Guinea, isolation within the crater has forced species to evolve by natural selection. Could look at examples of this and how they have the survival advantage. Fossil record – look at some real life fossils. Can we

		potential benefits that this technology can offer, genetic modification still remains highly controversial.		identify them? How old are they? What caused the extinction of the dinosaurs? Look at evidence for/against this. Species that are currently endangered or extinct. What caused/is causing this problem? Discuss effects that humans are having. Eg) How humanity killed the dodo.