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## Subject: BIOLOGY (Trilogy Higher) Year 10 Curriculum Map 2020 – 2021

### Resources:

Week Commencing	Topic (including links to additional resources)	Assessment Window
1 <sup>st</sup> September	Bridging work	
7 <sup>th</sup> September	Bridging work	
14 <sup>th</sup> September	Bridging work	
21 <sup>st</sup> September	Bridging work (TOTAL OF 6 lessons of bridging work)	
28 <sup>th</sup> September	<p><b><u>TOPIC Homeostasis and response</u></b>  <b><u>Lesson 1 Introduction to homeostasis</u></b>            Explain what homeostasis is and why it is important.            Describe examples of conditions that need to be controlled.            Describe the roles of the nervous system and the endocrine system in homeostasis.            Describe the main components of a control system and their functions.</p> <p><b><u>Lesson 2 Structure and function of nervous system</u></b>            Explain the importance of being able to respond to environmental changes and coordinate behaviour.            Explain how the nervous system is adapted for its functions.            Describe the functions of the main structures in the nervous system.            Explain the role of chemicals at synapses</p>	
5 <sup>th</sup> October	<p><b><u>Lesson 3 Required practical – reaction time</u></b>            Describe and use different methods to measure reaction time.            Required practical            Make a plan to investigate a factor on human reaction time.            Carry out a controlled investigation, present and analyse the results.</p>	
12 <sup>th</sup> October	<p><b><u>Lesson 4 Reflex actions – The brain</u></b>            Explain the importance of reflex actions and give examples.            Describe the differences between voluntary and reflex actions.            Describe the stages of a reflex action.</p> <p><b><u>Lesson 5 - Human Endocrine system</u></b>            Describe the endocrine system and define the term hormone.            Label a diagram of the organs in the endocrine system.            Explain why the pituitary gland is often called the master gland.</p>	

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	Compare the actions of the nervous and endocrine systems.	
19 <sup>th</sup> October (inset Friday 22 <sup>nd</sup> )	<p><b><u>Lesson 6 – Control of blood glucose concentration</u></b> Describe how blood glucose concentration is monitored and controlled. Explain when insulin is produced and how it helps to control blood glucose levels. Describe glycogen as a stored carbohydrate.</p> <p>HT: Explain when glucagon is produced by the pancreas and its effect on blood glucose levels. Explain how insulin and glucagon work together to control blood glucose levels.</p>	
Half Term		
2 <sup>nd</sup> November	<p><b><u>Lesson 7 – Blood glucose continued and diabetes</u></b> Explain the cause, effects, treatment and problems associated with Type 1 diabetes. Interpret glucose tolerance test results. Evaluate modern methods of treating diabetes. Explain the cause, treatment and problems associated with Type 2 diabetes. Compare the causes, and treatments of Type 1 and Type 2 diabetes.</p> <p><b><u>Lesson 8 – Hormones in Human Reproduction</u></b> Describe secondary sexual characteristics of boys and girls. Explain the cause of these changes in boys and girls and their relevance in reproduction. Describe the menstrual cycle and fertility including the role of hormones. Oestrogen is secreted by the ovaries. It inhibits production of FSH and stimulates release of LH. It makes the uterus lining grow again after menstruation. Progesterone is secreted by the empty follicle in the ovary after ovulation. It inhibits FSH and LH production and maintains the lining of the uterus during the second half of the cycle. HT: explain the interaction between these hormones in the control of the menstrual cycle. Describe hormonal and non-hormonal methods of contraception. Explain how hormonal and non-hormonal contraceptives work. Evaluate their use.</p>	
9 <sup>th</sup> November	<p><b><u>Lesson 9 - The use of hormones to treat infertility</u></b> Describe the use of fertility drugs in women with low FSH levels. Use a model, eg a flow diagram to explain the process of In Vitro Fertilisation (IVF). Evaluate the use of fertility treatments.</p>	
16 <sup>th</sup> November	<p><b><u>Lesson 10 – Negative Feedback</u></b> Describe where and when adrenaline is released and its target organs. Describe the effects of adrenaline on the body. Draw a diagram to explain how levels of adrenaline are controlled by a negative feedback system. Describe where thyroxine is produced and its effects on the body. Draw a diagram to explain how its release is stimulated by thyroid stimulating hormone and the levels of these two hormones are controlled by a negative feedback system.</p> <p><b><u>TOPIC 6 Inheritance, variation and evolution</u></b> <b><u>Lesson 1 – Sexual and asexual reproduction</u></b> Explain why sexual reproduction produces variation in the offspring, but asexual reproduction does not. Describe sexual reproduction in animals and plants. Define the term clone.</p>	

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23 <sup>rd</sup> November	<p><b><u>Lesson 2 - Meiosis</u></b>          Explain the term gametes and describe their genetic material.          Explain why sexual reproduction results in variety.          Draw diagrams to explain how gametes are formed in meiosis.          Explain the number of chromosomes in the gametes during meiosis and fertilisation.          Describe how an embryo is formed.          Compare mitosis and meiosis</p>	
30 <sup>th</sup> November	AR1 Assessment	AR 1 ASSESSMENTS
7 <sup>th</sup> December	DDI Wave 1 DDI Wave 2	AR 1 ASSESSMENTS
14 <sup>th</sup> December	<p><b><u>Lesson 3 – Sex determination</u></b>          Explain using a Punnett square and genetic diagram how sex is determined in humans.          Explain the probability of having a child that is a boy or a girl.</p> <p><b><u>Lesson 4 – DNA</u></b>          Describe the structure of chromosomes, DNA and genes.          Explain that a gene is a small section of DNA that codes for a particular sequence of amino acids to make a specific protein.          Describe what the genome is.          Explain how knowledge of the human genome will help medicine in the future, eg identifying genes linked to cancers, understanding and treating inherited disorders. It will also help trace human migration patterns.          Explain the ethical issues related to DNA sequencing.</p>	
Christmas Holiday		
4 <sup>th</sup> January	<p><b><u>Lesson 5 – Genetic Inheritance and inherited disorders</u></b>          Give examples of characteristics controlled by a single gene and describe their alleles.          Give examples of characteristics controlled by multiple genes.          Define and use the terms: gametes, genotype, phenotype, dominant recessive, homozygous and heterozygous.          Complete a Punnett square to show the outcomes of genetic crosses.          Interpret the results of a genetic cross diagram and use direct proportion and simple ratios to express the outcomes. Describe the genotypes and phenotypes of the offspring.</p>	
11 <sup>th</sup> January	<p><b><u>Lesson 6 – Inherited disorders continued</u></b>          Describe the inherited disorders polydactyly and cystic fibrosis.          Use genetic cross diagrams to explain inheritance and carriers.          Make informed judgements about the economic, social and ethical issues concerning embryo screening.          Discuss the use of genetic modification to treat genetic disorders          HT: Construct Punnett squares and genetic crosses.</p> <p><b><u>Lesson 7 – Genetic Engineering</u></b>          Define the term genetic engineering.          Describe the process of genetic engineering and its advantages.          HT: Describe in detail the process of genetic engineering.          Evaluate the use of genetic engineering in medicine, eg in gene therapy and production of hormones and some vaccines.          Interpret information about genetic engineering techniques.          Make informed judgements about the economic, social and ethical issues concerning genetic engineering and GM crops.          Explain advantages and disadvantages of genetic engineering.</p>	
18 <sup>th</sup> January	<p><b><u>Lesson 8 – Variation and evolution</u></b>          Classify characteristics as being due to genetic, environmental or a combination of these causes.</p>	

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	<p>Give examples of continuous and discontinuous variation.</p> <p>Decide the best way to present information about variation in tables and charts</p>	
25 <sup>th</sup> January	<p><b><u>Lesson 9 – Selective breeding</u></b></p> <p>Explain why humans selectively breed plants and animals.</p> <p>Describe selective breeding as a type of sexual reproduction.</p> <p>Describe the process of selective breeding and give examples.</p> <p>Explain the benefits and risks of selective breeding in plants and animals.</p> <p><b><u>Lesson 10 – Evolution</u></b></p> <p>Describe Darwin's theory of evolution by natural selection.</p> <p>Describe the main stages of natural selection as:</p> <ul style="list-style-type: none"> <li>•individual organisms within a particular species may show a wide range of phenotype variation because of differences in their genes</li> <li>•individuals with characteristics most suited to the environment are more likely to survive to breed successfully</li> <li>•the genes that have enabled these individuals to survive are then passed on to the next generation.</li> </ul> <p>Define the term mutation.</p> <p>Explain why mutation may lead to more rapid change in a species.</p> <p>Define the term species.</p> <p>Identify organisms that are of different species.</p> <p>Interpret evolutionary trees.</p>	
1 <sup>st</sup> February	<p><b><u>Lesson 11 – Evidence for evolution</u></b></p> <p>Describe the evidence for the theory of evolution by natural selection.</p> <p>Define the term 'fossil'.</p> <p>Describe how fossils may be formed:</p> <ul style="list-style-type: none"> <li>•from parts of organisms that have not decayed because one or more of the conditions needed for decay are absent</li> <li>•when parts of the organism are replaced by other materials as they decay</li> <li>•as preserved traces of organisms, eg footprints, burrows and rootlet traces.</li> </ul> <p>Explain why scientists cannot be certain how life began on Earth.</p> <p>Explain how fossils provide evidence for evolution.</p> <p>Explain what we should do to slow down the rate of development of resistant strains of bacteria.</p> <p>Describe the impact of antibiotic resistance.</p>	
8 <sup>th</sup> February (Inset 12 <sup>th</sup> February)	<p><b><u>Lesson 12 – Extinction</u></b></p> <p>Define the term extinction.</p> <p>Explain how extinction may be caused.</p> <p>Explain that organisms become extinct because something changes and the species cannot adapt quickly enough to the new circumstances.</p> <p><b><u>Lesson 13 – Consolidation and review</u></b></p>	
February Half Term		
22 <sup>nd</sup> February	<p>TOPIC 7 ECOLOGY</p> <p><b><u>Lesson 1 – Classification</u></b></p> <p>Classify organisms based on their similarities.</p> <p>Describe classification using:</p> <ul style="list-style-type: none"> <li>•Kingdom</li> <li>•Phylum</li> <li>•Class</li> <li>•Order</li> <li>•Family</li> <li>•Genus</li> <li>•Species.</li> </ul> <p>Explain why the importance of the binomial system to name organisms.</p> <p>Describe Carl Woese's system of classification and classify organisms into the three mains.</p>	

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	Explain how modern technologies have affected how organisms are classified today.	
1 <sup>st</sup> March	<p><b>Lesson 2 – Communities</b> Understand and use the terms ecosystem, community, competition, habitat, interdependence.</p> <p>Describe factors that affect the survival of organisms in their habitat. Explain how one species depends on others for survival.</p> <p>Describe a stable community as one where all the species and environmental factors are in balance, so population sizes remain fairly constant. Give an example of a stable community.</p> <p>Describe resources that plants and animals compete for in a given habitat.</p> <p><b>Lesson 3 – Biotic and abiotic factors</b> Name biotic factors in a habitat and explain how a change in a biotic factor might affect a community, eg:</p> <ul style="list-style-type: none"> <li>•availability of food</li> <li>•new predators arriving</li> <li>•new disease organisms</li> </ul> <p>•one species out-competing another so the numbers are no longer sufficient to breed.</p> <p>Name abiotic factors in a habitat and explain how a change in a biotic factor might affect a community, eg:</p> <ul style="list-style-type: none"> <li>•light intensity</li> <li>•temperature</li> <li>•moisture levels</li> <li>•soil pH and mineral content</li> <li>•wind intensity and direction</li> <li>•carbon dioxide levels for plants</li> <li>•oxygen levels for aquatic animals.</li> </ul>	
8 <sup>th</sup> March	<p><b><u>Lesson 4 – Distribution of organisms</u></b> Describe how to carry out random sampling of organisms using a quadrat. Describe when and how a transect should be used. Evaluate data gathered by using a quadrat and transect. Calculate area, mean, median, mode and range. Explain why sample size is important to obtain valid results.</p>	
15 <sup>th</sup> March	<p><b><u>Lesson 5 – Required practical</u></b> Required practical: plan and carry out a valid method to estimate a plant population. Present and analyse the results</p> <p><b><u>Lesson 6 - Adaptations</u></b> Describe and explain how structural, behavioural and functional adaptations, in a range of organisms, help them to survive in their habitat. Define the term extremophile and give general examples.</p>	
22 <sup>nd</sup> March	<p><b><u>Lesson 7 – Levels of organisation</u></b> Explain what a food chain shows. Explain that photosynthetic organisms are the producers of biomass for life on Earth. Identify producers, primary, secondary and tertiary consumers in a food chain. Interpret and explain population curves, eg hare and lynx, red and grey squirrels, and native and American crayfish.</p>	
29 <sup>th</sup> March	<p><b><u>Lesson 8 and 9 – How materials are cycled</u></b> Interpret and explain the processes in diagrams of the carbon, water and decay cycles. Explain the importance of these cycles to living things. Explain the carbon cycle. Explain the water cycle. Explain the role of microorganisms in cycling materials through an ecosystem.</p>	

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Easter Holiday		
19 <sup>th</sup> April	<p><b><u>Lesson 10 – Biodiversity</u></b>  Define the term biodiversity.  Explain how great biodiversity maintains food supplies and shelter for organisms, and maintains the physical environment.  Describe examples of how a reduction in biodiversity can affect climate, food supplies for humans, useful chemical for the future etc.</p>	
26 <sup>th</sup> April	<p><b><u>Lesson 11 and 12 – Waste management</u></b>  Define the term biodiversity.  Explain how great biodiversity maintains food supplies and shelter for organisms, and maintains the physical environment.  Describe examples of how a reduction in biodiversity can affect climate, food supplies for humans, useful chemical for the future etc.  Describe the problems associated with an increasing human population.  Interpret graphs showing human population growth.  Describe how water can be polluted with sewage, fertiliser or toxic chemicals.  Analyse and interpret data about water pollution.  Describe examples of air pollutants and where they come from.  Describe the effects of smoke on buildings, humans and plant photosynthesis.  Describe how acid rain is formed and the effects of acid rain on living organisms.  Analyse and interpret data about air pollution.  Evaluate the use of fertiliser on plant growth and oxygen levels.  Describe what herbicides and pesticides are used for.</p>	
3 <sup>rd</sup> May	<p><b><u>Lesson 13 – Land use and deforestation</u></b>  Explain what peat is and why it is important to preserve areas of peat.  Explain why peat should not be burnt.</p>	
10 <sup>th</sup> May	<p><b><u>Lesson 14 and 15 continued</u></b>  Define the term deforestation.  Explain why vast tropical areas have been cleared of trees.  Explain how deforestation increases the amount of carbon dioxide in the atmosphere and leads to a reduction in biodiversity.</p>	
17 <sup>th</sup> May	AR2 preparation	
24 <sup>th</sup> May	AR2 exam	AR 2 ASSESSMENTS
7 <sup>th</sup> June	DDI WAVE 1	AR 2 ASSESSMENTS
14 <sup>th</sup> June	DDI Wave 2 Reassessment and review	
21 <sup>st</sup> June	Lesson 16 – Global warming	
28 <sup>th</sup> June	Consolidation and review	
5 <sup>th</sup> July		

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12 <sup>th</sup> July		
19 <sup>th</sup> July (School closed from 22 <sup>nd</sup> )	Consolidation and review	

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