



Course outline IGCSE Biology Year 11
Second Term 2011-12

Week/Topic	Learning out comes	Assessment
1.Reproduction		
1.1 Asexual Reproduction (week 1)	<ul style="list-style-type: none"> Define <i>asexual reproduction</i>. Describe asexual reproduction in bacteria, spore production in fungi and tuber formation in potatoes. Discuss the advantages and disadvantages to a species of asexual reproduction. 	
1.2 Sexual reproduction (week 1)	<ul style="list-style-type: none"> Define <i>sexual reproduction</i>. Discuss the advantages and disadvantages to a species of sexual reproduction 	Home work#1
1.2.1 Sexual reproduction in plants (week 1-2)	<ul style="list-style-type: none"> (Candidates should expect to apply their understanding of the flowers they have studied to unfamiliar flowers.) Define <i>pollination</i> Name the agents of pollination Compare the different structural adaptations of insect-pollinated and wind-pollinated flowers. Describe the growth of the pollen tube and its entry into the ovule followed by fertilisation. Investigate and describe the structure of a non-endospermic seed in terms of the embryo (radicle, plumule and cotyledons) and testa, protected by the fruit. Outline the formation of a seed and fruit. Dispersal of seeds and fruits by wind and animals. 	Quiz# 1 Lab#1 Home work#2
1.2.2 Sexual reproduction in humans (week 3)	<ul style="list-style-type: none"> Identify the parts of male reproductive system and state their function. Identify the parts of female reproductive system and state their function. 	
(week 3-4)	<ul style="list-style-type: none"> Compare male and female gametes in terms of size, numbers and mobility. Describe the menstrual cycle in terms of changes in the uterus and ovaries. Explain the role of hormones in controlling 	Quiz#2 Home work#3

	<p>the menstrual cycle (including FSH, LH, progesterone and oestrogen)</p> <ul style="list-style-type: none"> • Outline sexual intercourse and describe Fertilization. • Outline early development of the zygote. • Outline the development of the fetus. • Describe the function of the placenta, umbilical cord, amniotic sac and amniotic fluid. • Describe the ante-natal care of pregnant women including special dietary needs and maintaining good health. • Outline the processes involved in labour and birth. • Describe the advantages and disadvantages of breast-feeding compared with bottle-feeding using formula milk. 	
1.3 Sex hormones (week 4)	<ul style="list-style-type: none"> • Describe the roles of testosterone and oestrogen in the development and regulation of secondary sexual characteristics at puberty. • Describe the sites of production and the roles of oestrogen and progesterone in the menstrual cycle and in pregnancy. 	Home work#4
1.4 Methods of birth control (week 5)	<ul style="list-style-type: none"> • Outline the following methods of birth control: <ul style="list-style-type: none"> • natural (abstinence, rhythm method) • chemical (contraceptive pill, spermicide) • mechanical (condom, diaphragm, femidom, IUD) • surgical (vasectomy, female sterilisation) • Outline artificial insemination and the use of hormones in fertility drugs, and discuss their social implications 	
1.5 Sexually transmissible diseases (week 5)	<ul style="list-style-type: none"> • Describe the symptoms, signs, effects and treatment of gonorrhoea. • Describe the methods of transmission of human immunodeficiency virus (HIV), and prevention. • Outline how HIV affects the immune system in a person with HIV/AIDS. 	Test#1 Project#1 Home work#5
2. Growth and development (week 5)	<ul style="list-style-type: none"> • Define <i>growth</i> • Define <i>development</i>. • Investigate and state the environmental conditions that affect germination of seeds: 	
3. Inheritance (week 6)	<ul style="list-style-type: none"> • Define <i>inheritance</i>. 	

3.1 Chromosomes (week 6)	<ul style="list-style-type: none"> Define the terms: <i>chromosome, gene, allele, haploid nucleus, and diploid nucleus.</i> Describe the inheritance of sex in humans (XX and XY chromosomes) 	
3.2 Mitosis (week 6)	<ul style="list-style-type: none"> Define <i>mitosis</i>. State the role of mitosis in growth, repair of damaged tissues, replacement of worn out cells and asexual reproduction. 	Lab#2 Quiz#3 Home work#6
3.3 Meiosis (week 6)	<ul style="list-style-type: none"> Define <i>meiosis</i>. State that gametes are the result of meiosis State that meiosis results in genetic variation. 	
3.4 Monohybrid inheritance (week 7)	<ul style="list-style-type: none"> Define the terms: <i>genotype, phenotype, homozygous, heterozygous, dominant and recessive</i> Calculate and predict the results of monohybrid crosses involving 1 : 1 and 3 : 1 ratios. Explain codominance by reference to the inheritance of ABO blood groups. 	
3.5 Variation (week 7)	<ul style="list-style-type: none"> Describe continuous and discontinuous variations with examples. State examples for continuous and discontinuous variations. Define <i>mutation</i>. Describe mutation as a source of variation, as shown by Down's syndrome. Outline the effects of ionising radiation and chemicals on the rate of mutation. Describe sickle cell anaemia, and explain its incidence in relation to that of malaria. 	
3.6 Selection (week 7)	<ul style="list-style-type: none"> Describe artificial selection and its importance. Define <i>natural selection</i>. Describe variation and competition. Assess the importance of natural selection. Describe the development of strains of antibiotic resistant bacteria as an example of natural selection. 	Test#2 Home work#7
3.7 Genetic Engineering (week 7)	<ul style="list-style-type: none"> Define <i>genetic engineering</i>. Explain why, and outline how, human insulin genes were put into bacteria using genetic engineering. 	
Section IV Relationship of organisms with one another and with their environment		
1. Energy flow (week 8)	<ul style="list-style-type: none"> State that the Sun is the principal source of energy input to biological systems. 	

	<ul style="list-style-type: none"> Describe the non-cyclical nature of energy flow. 	
2. Food chains and food webs (emphasis on examples occurring locally) <i>(week 8)</i>	<ul style="list-style-type: none"> Define <i>food chain</i> Explain why food chains usually have fewer than five trophic levels. Define <i>food web</i>. Explain why there is an increased efficiency in supplying green plants as human food and that there is a relative inefficiency, in terms of energy loss, in feeding crop plants to animals. Define the terms: <i>producer, consumer, herbivore, carnivore, decomposer, ecosystem and trophic level</i> Describe energy losses between trophic levels. Draw, describe and interpret pyramids of biomass and numbers. 	Quiz#4 Project#2 Home work#8
3. Nutrient cycles <i>(week 8-9)</i>	<ul style="list-style-type: none"> Describe the carbon and the water cycles. Describe the nitrogen cycle in terms of: decomposition, nitrogen fixation, nitrification and de-nitrification. Discuss the effects of the combustion of fossil fuels and the cutting down of forests on the oxygen and carbon dioxide concentrations in the atmosphere. 	
4. Population size <i>(week 9)</i>	<ul style="list-style-type: none"> Define <i>population</i>. State the factors affecting the rate of population growth for a population of an organism. Identify the lag, exponential (log), and stationary and death phases in the sigmoid population growth curve for a population growing in an environment with limited resources. Describe the increase in human population size and its social implications. Interpret graphs and diagrams of human population growth. Explain the factors that lead to the lag phase, exponential (log) phase and stationary phase. 	Home work#9
5. Human influences on the	<ul style="list-style-type: none"> Outline the effects of humans on ecosystems, with emphasis on examples of 	

ecosystem (week 9)	international importance (tropical rainforests, oceans and important rivers)	
5.1 Agriculture (week 10)	<ul style="list-style-type: none"> List the undesirable effects of deforestation (to include extinction, loss of soil, flooding, carbon dioxide build up) Describe the undesirable effects of overuse of fertilisers (to include eutrophication of lakes and rivers) 	
5.2 Pollution (week 10)	<ul style="list-style-type: none"> Describe the undesirable effects of pollution to include: <ul style="list-style-type: none"> water pollution by sewage and chemical waste air pollution by sulfur dioxide and greenhouse gases (carbon dioxide and methane) contributing to global warming. pollution due to pesticides and herbicides and nuclear fall-out. Discuss the effects of non-biodegradable plastics in the environment Discuss the causes and effects on the environment of acid rain. Explain how increases in greenhouse gases (carbon dioxide and methane) are thought to cause global warming. 	Home work #10 Test #3 Project #3
5.3 Conservation (week 10)	<ul style="list-style-type: none"> Describe the need for conservation of: <ul style="list-style-type: none"> species and their habitats natural resources (limited to water and non-renewable materials including fossil fuels) Explain how limited and non-renewable resources can be recycled (including recycling of paper and treatment of sewage to make the water that it contains safe to return to the environment or for human use) 	
<i>Week 11</i>	Second Term Examination	50%