

Subject: Biology 2019-2020

Scheme of work/Term wise syllabus breakup

Class Level: 11th O - LEVEL

FIRST TERM				
Strand	Unit	Topic	Objective	Week
	Relationships of organisms with one another and with the environment	15.1 Energy flow 15.2 Food chains and food webs 15.3 Carbon cycle 15.4 Nitrogen cycle 15.5 Parasitism 15.6 Effects of humans on the ecosystem 15.7 Pollution 15.8 Conservation	(a) state that the Sun is the principal source of energy input to biological systems (b) describe the non-cyclical nature of energy flow (c) define the following terms and establish the relationship of each in food webs: • producer – an organism that makes its own organic nutrients, usually using energy from sunlight through photosynthesis • consumer – an organism that gets its energy by feeding on other organisms • herbivore – an animal that obtains its energy by eating plants • carnivore – an animal that obtains its energy by eating other animals • decomposer – an organism that obtains its energy from dead or waste organic matter • food chain – a chart showing the flow of energy (food) from one organism to the next, beginning with the producer (e.g. mahogany tree → caterpillar → songbird → hawk)	1
			(d) describe energy losses between trophic levels and infer the advantages of short food chains (e) describe and interpret pyramids of numbers and of biomass (f) describe and state the importance of the carbon cycle (g) describe the nitrogen cycle in making available nitrogen for plant and animal protein, including the	1

			<p>role of bacteria in nitrogen fixation, decomposition and nitrification (details of denitrification and the names of individual bacteria are not required)</p> <p>(h) understand the role of the mosquito as a vector of disease</p> <p>(i) describe the malarial pathogen as an example of a parasite and describe the transmission and control of the malarial pathogen (details of the life cycle of the pathogen are not required)</p> <p>(j) describe the effects of humans on the ecosystem with emphasis on examples of international importance (tropical rainforests, oceans and important rivers)</p> <p>(k) describe the consequences of deforestation in terms of its effects on soil stability, climate and local human populations</p> <p>(l) evaluate the effects of: water pollution by sewage, by inorganic waste and by nitrogen-containing fertilisers air pollution by greenhouse gases (carbon dioxide and methane), contributing to global warming air pollution by acidic gases (sulfur dioxide and oxides of nitrogen), contributing to acid rain pollution due to insecticides</p> <p>(m) discuss reasons for conservation of species with reference to maintenance of biodiversity, management of fisheries and management of timber production</p> <p>(n) discuss reasons for recycling materials, with reference to named examples.</p>	<p>1</p> <p>Total:3</p>
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	Development of organisms and continuity of life	16.1 Asexual reproduction	(a) define mitosis as cell division giving rise to genetically identical cells in which the chromosome number is maintained and state the role of mitosis in growth, repair of damaged tissues, replacement of worn out cells and asexual reproduction	1
		16.2 Sexual reproduction in plants	(b) define asexual reproduction as the process resulting in the production of genetically identical offspring from one parent and describe one named, commercially important application of asexual reproduction in plants	
		16.3 Sexual reproduction in humans	(c) define meiosis as a reduction division in which the chromosome number is halved from diploid to haploid	
		16.4 Sexually transmitted diseases	(d) state that gametes are the result of meiosis (reduction division)	
			(e) define sexual reproduction as the process involving the fusion of haploid nuclei to form a diploid zygote and the production of genetically dissimilar offspring	1
			(f) identify and draw, using a hand lens if necessary, the sepals, petals, stamens and carpels of one, locally available, named, insect-pollinated, dicotyledonous flower, and examine the pollen grains under a light microscope	
			(g) state the functions of the sepals, petals, anthers and carpels	1
			(h) use a hands lens to identify and describe the anthers and stigmas of one, locally available, named, wind-pollinated flower, and examine the pollen grains	

		<p>under a light microscope</p> <p>(i) outline the process of pollination and distinguish between self-pollination and cross-pollination</p> <p>(j) compare, using fresh specimens, an insect-pollinated and a wind-pollinated flower</p> <p>(k) describe the growth of the pollen tube and its entry into the ovule followed by fertilisation (production of endosperm and details of development are not required)</p> <p>(l) investigate and describe the structure of a non-endospermic seed in terms of the embryo (radicle, plumule and cotyledons) and testa, protected by the pericarp (fruit wall)</p> <p>(m) state that seed and fruit dispersal by wind and by animals provides a means of colonising new areas</p> <p>(n) describe the external features of one, locally available, named example of a wind-dispersed fruit or seed and of one named example of an animal-dispersed fruit or seed</p> <p>(o) investigate and state the environmental conditions that affect germination of seeds: suitable temperature, water and oxygen</p> <p>(p) describe the uses of enzymes in the germination of seeds</p> <p>(q) identify on diagrams of the male reproductive system and state the functions of the testes, scrotum, sperm ducts, prostate gland, urethra and penis</p> <p>(r) identify on diagrams of the female reproductive system and state the functions of the ovaries,</p>	<p>1</p> <p>1</p> <p>1</p>
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		<p>oviducts, uterus, cervix and vagina</p> <p>(s) compare male and female gametes in terms of size, numbers and mobility</p> <p>(t) describe the menstrual cycle, with reference to the alternation of menstruation and ovulation, the natural variation in its length and the fertile and infertile phases of the cycle</p> <p>(u) explain the role of hormones in controlling the menstrual cycle (including FSH, LH, progesterone and oestrogen)</p> <p>(v) describe fertilisation and early development of the zygote simply in terms of the formation of a ball of cells that becomes implanted in the wall of the uterus</p> <p>(w) state the function of the amniotic sac and the amniotic fluid</p> <p>(x) describe the function of the placenta and umbilical cord in relation to exchange of dissolved nutrients, gases and excretory products (no structural details are required)</p> <p>(y) describe the special dietary needs of pregnant women</p> <p>(z) describe the advantages of breast milk compared with bottle milk (aa) describe the following methods of birth control: natural, chemical (spermicides), mechanical, hormonal and surgical</p> <p>(bb) explain that syphilis is caused by a bacterium that is transmitted during sexual intercourse</p> <p>(cc) describe the symptoms, signs, effects and treatment of syphilis</p>	<p>Total : 6</p>
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			(l) describe the determination of sex in humans (XX and XY chromosomes) (m) describe variation and state that competition leads to differential survival of organisms, and reproduction by those organisms best fitted to the environment (n) assess the importance of natural selection as a possible mechanism for evolution (o) describe the role of artificial selection in the production of economically important plants and animals (p) explain that DNA controls the production of proteins (q) state that each gene controls the production of one protein (r) explain that genes may be transferred between cells (reference should be made to transfer between organisms of the same or different species) (s) explain that the gene that controls the production of human insulin can be inserted into bacterial DNA (t) understand that such genetically engineered bacteria can be used to produce human insulin on a commercial scale (u) discuss potential advantages and dangers of genetic engineering	1 <
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REVISION WHOLE SYLLABUS